A BIOLOGICAL INVENTORY AND EVALUATION

OF THE

ALLANDALE LAKE ALGONQUIN BLUFFS

AREA OF NATURAL AND SCIENTIFIC INTEREST

December 1988

Ontario

Ontario

Ministry of
Natural
Resources
Lyn McLeod
Minister

91-05997/

A BIOLOGICAL INVENTORY AND EVALUATION OF THE ALLANDALE LAKE ALGONQUIN BLUFFS AREA OF NATURAL AND SCIENTIFIC INTEREST

(31D/5 010100)

S. Varga

1988

Ontario Ministry of Natural Resources
Parks and Recreational Areas Section
Central Region, Richmond Hill

The full citation for this report is:

Varga, S. 1988. A Biological Inventory and Evaluation of the Allandale Lake Algonquin Bluffs Area of Natural and Scientific Interest. Parks and Recreational Areas Section, Ontario Ministry of Natural Resources, Open File Ecological Report 8809, Central Region, Richmond Hill, Ontario. vi + 66 pages + 3 folded maps.

For convenience, this report may be referred to as OFER 8809. It is one of a number of Open File Ecological Reports comprised of reconnaissance surveys and inventories of ecological areas in Ontario.

Additional copies of this report are obtainable from the Ontario Ministry of Natural Resources from the following source: Public Information Centre, Room 1640, Whitney Block, Queen's Park, Toronto, Ontario M7A 1W3.

Reference copies of this report are available in the offices of Central Region, 10670 Yonge Street, Richmond Hill, Ontario L4C 3C9 (Tel. [416]883-3240), and the Natural Resources Library, 4th Floor, Whitney Block, Room 4540, 99 Wellesley Street West, Toronto, Ontario M7A 1W3. Copies have been sent to university libraries in southern Ontario.

ISBN 0-7729-5002-4

© 1988, Queen's Printer for Ontario
Printed in Ontario, Canada

SUMMARY

The Allandale Lake Algonquin Bluffs Area of Natural and Scientific Interest comprises two areas totalling 539 ha just southwest of the City of Barrie, in Essa and Innisfil Townships, Simcoe County.

Allandale is situated within Peterborough Site District 6-8, but it has more in common with the adjacent Barrie Site District 6-6. The ANSI lies in the physiographic unit known as the Simcoe Uplands and Lowlands, landforms strongly influenced by postglacial Lake Algonquin (Chapman and Putnam, 1984).

As a result of an evaluation of remnant natural areas in southern Ontario, the Ministry of Natural Resources has identified the Allandale Lake Algonquin Bluffs ANSI as a provincially significant life science site (OMNR, 1983; Hanna, 1984a). The present study was undertaken to (a) describe and map the vegetation communities; (b) identify and map the significant/ sensitive areas, provincially and regionally rare species; (c) re-assess the boundaries of the Area of Natural and Scientific Interest; and (d) propose general management concepts.

Fieldwork consisted of systematically cruising the ANSI to ensure that each habitat type was visited. Within each community, species lists were compiled for the tree, sapling, shrub and herbaceous layers. Environmental parameters such as soil type, soil moisture, microclimate, slope aspect and degree of disturbance were noted. Incidental observations of mammals, breeding birds, reptiles and amphibians were also made. The status of breeding birds was assessed using the criteria outlined in the Atlas of the Breeding Birds of Ontario (Cadman *et al.*, 1987).

Fieldwork was carried out over 15 days; July 10, September 30, October 1, 5, 6, 10, 11, 12, 19, 20, 22, 23 and November 3, 15 in 1987 and May 18 and June 3 in 1988. A series of early frosts made it difficult to map some of the rare species.

The principal physical attribute of Allandale is its 7 km long, 50 to 70 m high erosional bluff (the shoreline of postglacial Lake Algonquin). The bluffs are characterized by a prominent mid-slope terrace and are highly dissected by 7 valley systems, greatly adding to the diversity of slope aspects. Below the bluffs, the ANSI includes a portion of the Simcoe Lowlands, the former bed of Lake Algonquin.

The vegetation was divided into three major units: wetlands (8 community types on 134 ha representing 25% of the ANSI), upland forest (17 community types on 363 ha or 67% of the ANSI) and anthropogenic (3 community types on 42 ha or 8% of the ANSI).

The wetland vegetation types are located on large seepage areas in valley bottomlands, the lowlands below the bluffs and some of the mid-slope terraces. They sustain conifer, mixed and deciduous swamps, with emergent marsh, meadow marsh and beaver ponds occurring as minor non-forested wetlands within these swamps.

The uplands support extensive deciduous forests of Red Oak on dry sites and Sugar Maple on mesic sites, with Large-toothed Aspen in combination with the first two species on successional, post-logged sites. Other deciduous trees, such as Beech, Red Maple and Trembling Aspen dominate smaller areas. Mixed forests of Hemlock, White Cedar or White Pine are infrequent, occupying about 6% of the ANSI.

Anthropogenic communities occur in the form of scattered upland fields, 6 small conifer plantations, an abandoned borrow pit and a man-made pond. Larger anthropogenic communities have been excluded from the ANSI. These include: a large abandoned gravel pit in the central portion, 2 areas of cultivated fields and conifer plantations in the eastern portion, and a Red Pine plantation in the western portion.

The communities at Allandale sustain a total of 449 species (450 taxa), of which 13 species are considered to be rare in Simcoe County. Two of these species, Drooping Sedge (*Carex prasina*) and Rugulose Grapefern (*Botrychium rugulosum*) (Pryer and Britton, 1987), and an additional species American Ginseng (*Panax quinquefolium*) (Argus and White, 1984) are considered provincially rare. Moreover, American Ginseng and Drooping Sedge are also nationally rare (Argus and Pryer, 1986). Most of the rarities occur in the upland fields (community type 12 - 4 rare species), Red Oak forests (community types 8a and 8b - 5 rare species), Sugar Maple forests (community types 6a,b,c - 4 species) and the swamps (community types 3, 4 and 5 - 3 rare species). Ten of the 14 significant plants are southern ones near the limit of their range, 5 of these with prairie affinities.

The fauna is representative of the area. Further faunal inventories are required to augment this report.

The significance of Allandale was determined using the criteria outlined in the Revised Report Format (O.M.N.R., 1976). Most of the ANSI was classified into 9 significant areas, confirming the assessment of this site as provincially significant. The anthropogenic communities and some of the successional stands were excluded from the significant designation. It was concluded that Allandale represents the largest and most vegetatively diverse example of postglacial Lake Algonquin, erosional bluffs in the Simcoe Uplands/Lowlands Physiographic Regions (Site Districts 6-6, 6-7, 6-8). In particular, the oak forests (community types 8a and 8b), in association with these bluffs, were considered to be unique to the region, being the only sizeable example within the ANSI system. In addition, Allandale as a whole, provides a regionally unique opportunity for research into the relationship of vegetation to such physical parameters as slope aspect, degree of slope, microclimate and soil moisture.

Most of the significant areas in Allandale were assessed as having extreme or high constraints to development. The wetlands were considered to have extreme sensitivity because of their easily-compacted organic soils and the high moisture regimes. In contrast, the upland forested bluffs have high sensitivity because they are situated on steep sandy slopes which are easily erodible. Thirty-four ha of upland forest (community type 6d) was given a moderate sensitivity rating due to its more gradual slopes.

A number of management considerations are proposed:

1. Development proposals which could affect water quality and/or drainage should be discouraged because the plant communities are hydrologically related.

2. This area was initially chosen to represent the Lake Algonquin, glacial shoreline bluffs of Site District 6-8, and this inventory confirms the validity of that selection. In addition, the ANSI has also been found to support 14 rare plant species. Management of the site should retain these features.

3. The remaining mature stands could serve as scientific benchmarks and important seed sources for the surrounding successional forests (refer to vegetation communities in Map 1).

4. Landowners considering the construction of new homes should be encouraged to build outside the ANSI or, if not feasible, locating on non-significant areas away from rare species.

5. Landowners of 3 fields which support species of prairie affinities should be encouraged to retain them in a natural successional state (UTM GRID REFERENCES: 31D/5 014097. 014094, 994094).

6. Conifer plantations should be allowed to revert to native forest.

7. The owner of the active pit abutting the northwest portion of the ANSI should be encouraged to extract away from the ANSI, particularly the south side which contains a permanent stream. The gravel pit's site plan stipulates that extraction cannot occur closer than 30 m from the creek.

8. A detailed inventory of the fauna of the ANSI was not undertaken during this study, and such a survey is recommended.

9. Populations of rare plants should be monitored, especially the provincially rare/nationally threatened American Ginseng (*Panax quinquefolium*). Additional surveys should be carried out for *Desmodium dillenii* and *Carex prasina*.

10. The site should be inspected periodically to assess changes in vegetation, use of the site and level of disturbance.

ACKNOWLEDGMENTS

My thanks to those who aided in the production of this report. Dr. A.A. Reznicek provided useful information on the status of rare species and contributed to the plant checklist. Joyce Gould assisted on July IOth in the fieldwork, including the identification of breeding birds. Peter Harvie contributed floral and faunal information. John Riley, Regional Ecologist, provided direction for the study and edited the final copy. Kelly Lawrence drafted the maps.

TABLE OF CONTENTS

Page Number

SUMMARY i
ACKNOWLEDGMENTS iv
TABLE OF CONTENTS v
LIST OF FIGURES, TABLES AND MAPS vi
CHAPTER I: REGIONAL BACKGROUND
(i) INTRODUCTION 1
(ii) PHYSICAL BACKGROUND 1
a. Physiography 1
b. Climate and Microclimate 1
(iii) REGIONAL CONTEXT OF VEGETATION 3
CHAPTER II: ALLANDALE LAKE ALGONQUIN BLUFFS AREA OF NATURAL AND SCIENTIFIC INTEREST
(i) INTRODUCTION TO VEGETATION 4
(ii) COMMUNITY DESCRIPTIONS 4
(iii) FLORISTICS 22
(iv) FAUNA 22
CHAPTER III: PLANNING CONSIDERATIONS
(i) SIGNIFICANT FEATURES 24
(ii) PRELIMINARY ENVIRONMENTAL ANALYSIS 29
(iii) MANAGEMENT CONSIDERATIONS 30
REFERENCES 32
MAP REFERENCES 34

APPENDIX A: VASCULAR PLANTS OF THE ALLANDALE LAKE ALGONQUIN BLUFFS AREA OF NATURAL AND SCIENTIFIC INTEREST 35

APPENDIX B: DISTRIBUTION IN NORTH AMERICA AND ONTARIO FOR THREE PROVINCIALLY RARE PLANT SPECIES AT THE ALLANDALE LAKE ALGONQUIN BLUFFS ANSI: DROOPING SEDGE (*Carex prasina*), AMERICAN GINSENG (*Panax quinquefolium*) AND RUGULOSE GRAPEFERN (*Botrychium rugulosum*) 60

APPENDIX C: BIRDS OF THE ALLANDALE LAKE ALGONQUIN BLUFFS AREA OF NATURAL AND SCIENTIFIC INTEREST 62

APPENDIX D: MAMMALS AND AMPHIBIANS OF THE ALLANDALE LAKE ALGONQUIN BLUFFS AREA OF NATURAL AND SCIENTIFIC INTEREST 63

APPENDIX E: SLIDE DESCRIPTIONS 64

APPENDIX F: GENERAL INFORMATION SHEET - ALLANDALE LAKE ALGONQUIN BLUFFS AREA OF NATURAL AND SCIENTIFIC INTEREST 65

APPENDIX G: UPDATED LIFE SCIENCE INVENTORY CHECKSHEET 66

LIST OF FIGURES, TABLES AND MAPS

Page Number

FIGURES

1. Location of the Allandale Lake Algonquin Bluffs Area of Natural and Scientific Interest. 2

2. Four Vegetation Profiles for Allandale Lake Algonquin Bluffs Area of Natural and Scientific Interest. 7

3. Vegetation Matrix for the Allandale Lake Algonquin Bluffs Area of Natural and Scientific Interest. 9

TABLES

1. Climatic Records for the Region Around the Allandale Lake Algonquin Bluffs Area of Natural and Scientific Interest in Comparison with the Minimum and Maximum Records for the Southern Deciduous-Coniferous Forest Region 3

2. Significant Vascular Plants of the Allandale Lake Algonquin Bluffs Area of Natural and Scientific Interest. 5

3. Size of Plant Communities of the Allandale Lake Algonquin Bluffs Area of Natural and Scientific Interest. 6

4. Geographic Affinities of the Vascular Plants in the Allandale Lake Algonquin Bluffs Area of Natural and Scientific Interest. 23

5. Significance of Selected Areas in the Allandale Lake Algonquin Bluffs Area of Natural and Scientific Interest 25

6. A Comparison of the Allandale Lake Algonquin Bluffs with other Areas of Natural and Scientific Interest Supporting Forested Erosional Bluffs in the Simcoe Lowlands/Uplands Physiographic Regions (Site Districts: 6-6, 6-7, 6-8). 26

MAPS

1. Vegetation of the Allandale Lake Algonquin Bluffs Area of Natural and Scientific Interest. . . . . back pocket

2. Significant Flora of the Allandale Lake Algonquin Bluffs Area of Natural and Scientific Interest. . . . . back pocket

3. Significant Areas and Areas Sensitive to Development in the Allandale Lake Algonquin Bluffs Area of Natural and Scientific Interest . . . . . back pocket

CHAPTER I: REGIONAL BACKGROUND

(i) INTRODUCTION

The Allandale Lake Algonquin Bluffs Area of Natural and Scientific Interest is located in the Townships of Essa and Innisfil within Simcoe County (Figure I). It is situated 2 km southwest of the Town of Allandale and 65 km north of Metropolitan Toronto, just west of Highway 400. Its eastern boundary abuts the southwest limits of the Town of Barrie. The Area of Natural and Scientific Interest consists of 2 separate areas approximately 539 ha in size and 7 km long. All of the properties are privately owned.

The Allandale Lake Algonquin Bluffs was designated a provincially significant, life science ANSI in the Huronia District Land Use Guidelines (O.M.N.R., 1983), as representing a bluff vegetation complex in Peterborough Site District 6-8.

(ii) PHYSICAL BACKGROUND

a. Physiography

The ANSI is situated on the northern flank of the Innisfil Uplands and the southern edge of an adjacent flat-floored valley (Chapman and Putnam, 1984). This 3.5 km wide valley connects the lowlands surrounding Lake Simcoe with the Nottawasaga Basin east of Georgian Bay, and to the north it is defined by a prominent southfacing bluff.

The study area is dominated by a northfacing bluff which reaches a height of 50 m (220 - 270 m a.s.l.) in the west and 69.5 m (250 - 319.5 m a.s.l.) to the east. The bluff is highly dissected by 8 permanent streams, greatly adding to the diversity of slope aspects.

The bluffs and lowlands at Allandale are part of two Physiographic Regions: the Simcoe Lowlands and the Simcoe Uplands (Chapman and Putnam, 1984). These authors also placed the Allandale uplands in the Peterborough Drumlin Field Physiographic Region, but noted that the portion around Allandale is more closely aligned with the Simcoe Uplands.

The Simcoe Lowlands encompass Allandale's lower slopes to 260 m a.s.l. The contour demarcates the maximum extent of glacial Lake Algonquin, which covered all the region between 12,000 and 10,400 yBP (Chapman and Putnam, 1984). The soils consist of deltaic and lacustrine sands and, rarely, sandy loams.

The middle and upper slopes are part of the Simcoe Uplands, which were islands or peninsulas in Lake Algonquin. The soils consist of a sandy till covered by shallow sand and gravel deposits. These surface features may suggest shoreline deposition by a pre-Algonquin, glacial lake (Chapman and Putnam, 1984).

b. Climate and Microclimate

Allandale is located on a cooler and slightly drier area within the Southern Deciduous - Coniferous Forest Region (Table I). The Mean Annual Frost Free Period and the Mean Daily Minimum January Temperature, both critical factors limiting plant distributions, reach relatively low values in the Allandale area. Mean Annual Snowfall and Total Precipitation also reaches generally low values in the study area.

The northfacing bluffs at Allandale accentuate this cooler local climate. Most communities are situated on colder-than-normal sites. There are, however, warmer-than-normal sites on terraces, ridges, rims and southward-tending valley slopes cutting into the bluffs. It is on these warmer sites that one finds most of the plant species with southern affinities.

Figure 1: Location of Allandale Lake Algonquin Bluffs Area of Natural and Scientific interest

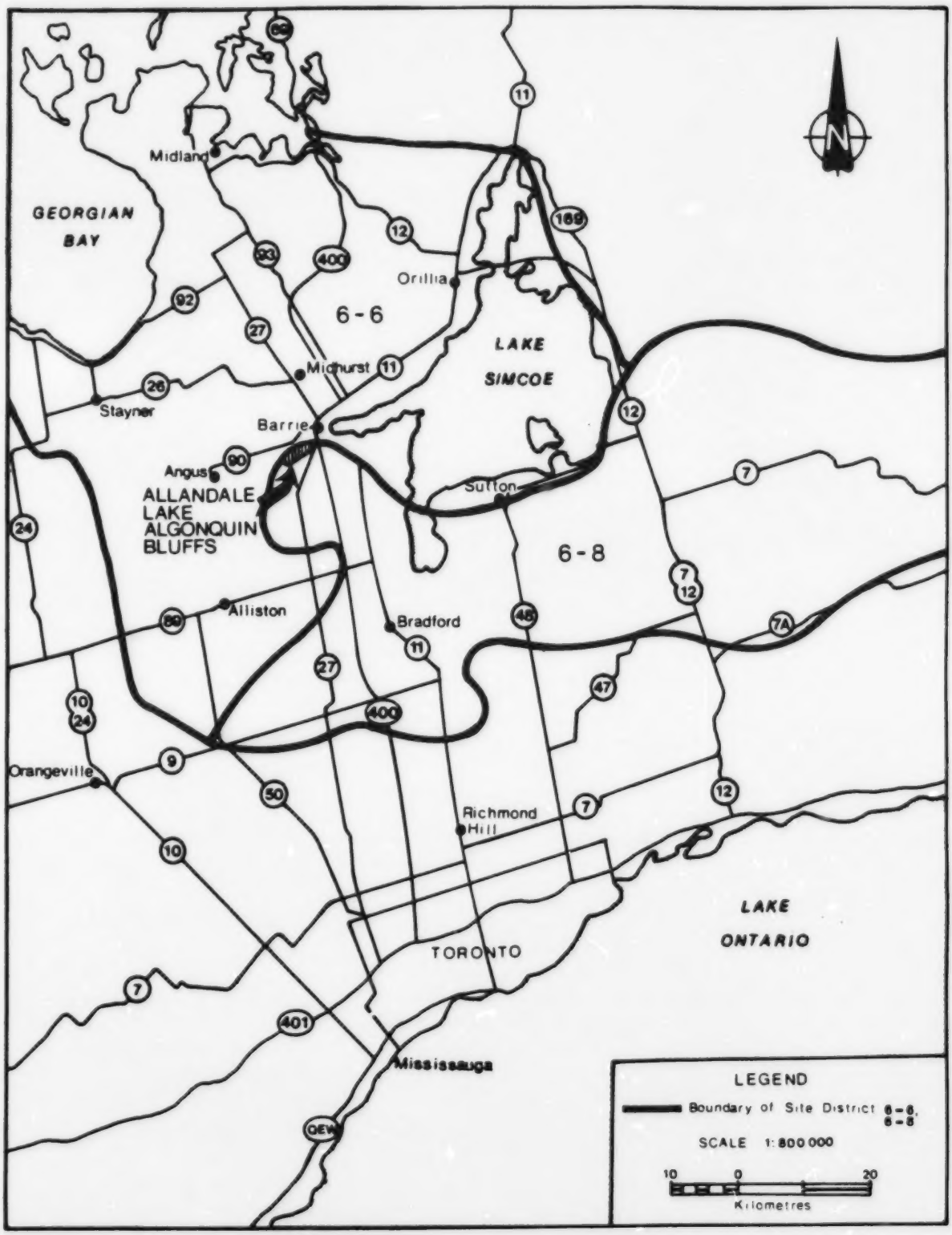


Table 1: Climatic Records for the Region Around the Allandale Lake Algonquin Bluffs Area of Natural and Scientific Interest, in Comparison with the Minimum and Maximum Records for the Southern Deciduous-Coniferous Forest Region (based on Brown, *et al.*, 1974)

		Southern Deciduous-Coniferous Forest Region	
	Allandale	Minimum	Maximum
Mean Annual Snowfall (cm)	203	163	284
Mean Annual Precipitation (cm)	81	79	102
Mean Daily Minimum January Temperature (C°)	-13	-16	-8
Mean Annual Frost Free Period (days)	130	120	150

(iii) REGIONAL CONTEXT OF VEGETATION

The study area is located in Lake Simcoe - Rideau Site Region 6E (Hills, 1959), also known as the Great Lakes - St. Lawrence Lowlands Forest Region of Rowe (1972), and the Southern Deciduous - Coniferous Forest Region of Maycock (1979). The site was chosen as one of 7 Life Science Areas of Natural and Scientific Interest, to represent the major vegetation-landform features of Peterborough Site District 6-8 (Hanna, 1984). Allandale was identified as the least disturbed and most vegetatively-diverse bluff complex in Site District 6-8.

Within this Site District, Allandale is located in the Simcoe Lowlands and Simcoe Uplands Physiographic Regions of Chapman and Putnam (1984). These 2 regions are best represented in the adjacent Barrie Site District 6-6. For the purpose of this report, Allandale will be compared with the 13 other Provincially Significant ANSIs occurring in the Simcoe Lowlands/Uplands Physiographic Regions. Eleven of these ANSIs are found in Site District 6-6 and one, the Pottageville Swamp ANSI, in Uxbridge Site District 6-7.

The vegetation of the two physiographic regions is characterized by Sugar Maple (*Acer saccharum*), Beech (*Fagus grandifolia*) and Hemlock (*Tsuga canadensis*) in various combinations on mesic sites. On drier sites, Red Oak (*Quercus rubra*) is an important species. Wetter sites predominate on the extensive muck soils in the lowlands. Here, one finds swamps of Silver Maple (*Acer saccharinum*), Hemlock (*Tsuga canadensis*) - Yellow Birch (*Betula alleghaniensis*), White Cedar (*Thuja occidentalis*) and the occasional boreal enclaves of Black Spruce (*Picea mariana*)-Tamarack (*Larix laricina*). The wettest areas sustain such non-forested wetlands as fens, marshes and, rarely, bogs.

CHAPTER II: ALLANDALE LAKE ALGONQUIN BLUFFS AREA OF NATURAL AND SCIENTIFIC INTEREST

(i) INTRODUCTION TO VEGETATION

Within Allandale, the diversity of slopes, in combination with a wide range of soil moisture (open water to dry) and soil types (organic to sand) has resulted in a wide array of forest types.

The bluffs support extensive forests of Red Oak (*Quercus rubra*) on dry sites and Sugar Maple (*Acer saccharum*) on mesic sites. A mosaic of successional stands of Large-toothed Aspen (*Populus grandidentata*), in combination with the first two species, are also common. In addition, there are smaller areas dominated by Hemlock (*Tsuga canadensis*), Beech (*Fagus grandifolia*), White Cedar (*Thuja occidentalis*), Red Maple (*Acer rubrum*), White Pine (*Pinus strobus*) and Trembling Aspen (*Populus tremuloides*).

Large seepage areas on the valley bottomlands, the lowlands below the bluffs and some of the terraces below the upper bluffs, sustain conifer, mixed and deciduous swamps. Emergent marsh, meadow marsh and beaver ponds occur as minor non-forested communities within these swamps.

Anthropogenic communities occur in the form of small scattered upland fields, an abandoned borrow pit and a man-made pond. Larger anthropogenic communities have been excluded from the ANSI. These include: a large abandoned gravel pit in the centre of the study area, the cultivated fields in the eastern portion and the sizeable conifer plantations scattered throughout the site.

The communities at Allandale sustain a total of 449 species (450 taxa) (Appendix A). Thirteen of these species are considered to be rare in Simcoe County (Table 2, refer to locations in Map 2). Reznicek (1987) defines a regionally rare species as one that occurs at 6 or less stations in Simcoe. Two of these species, Drooping Sedge (*Carex prasina*) (Ball and White, 1982), and Rugulose Grapefern (*Botrychium rugolosum*) (Pryer and Britton, 1987) and an additional species, American Ginseng (*Panax quinquefolium*) (Argus and White, 1984) are considered provincially rare. Moreover, *Carex prasina* and *Panax quinquefolium*) are also nationally rare (Argus and Pryer, 1986).

(ii) COMMUNITY DESCRIPTIONS

There are 28 plant communities grouped under 3 major headings (wetlands, upland forests and anthropogenic) within the Allandale Lake Algonquin Bluffs Area of Natural and Scientific Interest. The communities are outlined on Map 1. Because there are few communities in nature with distinct boundaries the lines delineating the different community types on Map 1 must be regarded as best approximations.

Detailed descriptions of the tree, sapling and understory stratas are given for each community. In addition, there is a brief outline of the soil type, soil moisture, microclimate, physical features, location in the study area and significant species. The areal extent of the various communities is shown on Table 3.

Typical vegetation profiles for Allandale are illustrated in Figure 2 (refer to Map 1 for location of the profiles).

The relationship of the plant communities to the Environmental parameters of soil moisture, soil type and microclimate is summarized in a vegetation matrix (Figure 3).

Table 2: **Significant Vascular Plants of the Allandale Lake Algonquin Bluffs Area of Natural and Scientific Interest and Vicinity**

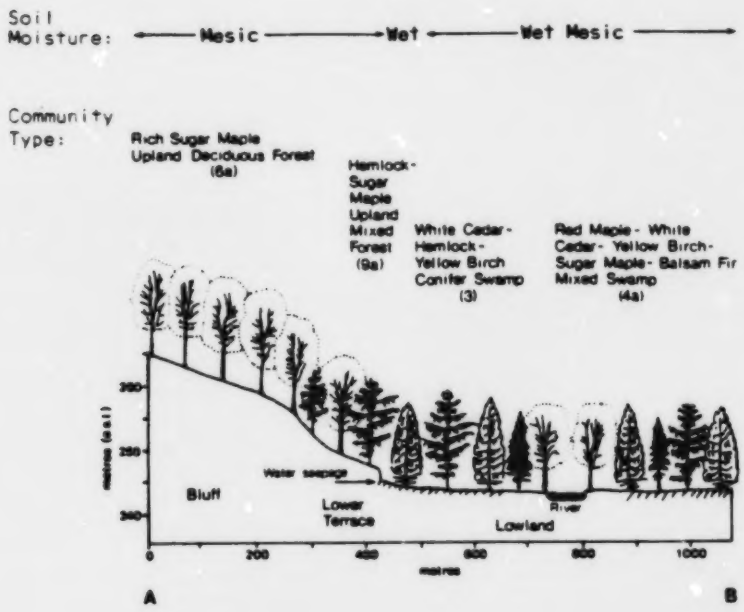
Species	Source	Number of Sites in Simcoe County
Nationally and Provincially Rare (Argus *et al.* 1982-87; Argus & Pryer, 1986)		
Carex prasina	SV	2
Panax quinquefolium	SV	N
Provincially Rare (Argus *et al.* 1982-87)		
Botrychium rugulosum	AAR	1
Regionally Rare (Reznicek, 1987)		
Carex foenea	SV	5
Carex platyphylla	SV	3
Desmodium dillenii	SV	2
Lespedeza capitata	SV	4
Lespedeza intermedia	SV	2
Pilea fontana	SV	3
Poa alsodes	SV	6
Potentilla arguta	SV	5
Rubus odoratus	SV	5
Sanicula trifoliata	SV	3
Viola adunca	SV	5
Nationally and Provincially Rare (in the vicinity of the ANSI)		
Chenopodium foggii	AAR	1
Cyperus houghtonii	AAR	N
Provincially Rare (in the vicinity of the ANSI)		
Valeriana uliginosa	AAR	5
Regionally Rare (in the vicinity of the ANSI)		
Amelanchier sanguinea var. *grandiflora*	AAR	2
Asclepias tuberosa	AAR	4
Betula pumila var *glandulifera*	AAR	2
Carex aenea	AAR	3
Carex cephalophora	AAR	5
Carex richardsonii	AAR	3
Ceanothus americanus	RB,AAR	4
Festuca saximontana	AAR	5
Gentiana crinita	AAR	4
Helianthemum bicknelli	AAR	1
Helianthemum canadense	AAR	3
Helianthus strumosus	AAR	1
Hieracium gronovii	AAR	3
Panicum oligosanthes	AAR	1
Platanthera hookeri	AAR	6
Polygala senega	AAR	4
Taenidia intergerrima	RB	6

LEGEND: **N** Not rare in Simcoe County; **RB** Rick Bobbette; **AAR** Tony Reznicek; **SV** Steve Varga

Table 3: Size of Plant Communities of the Allandale Lake Algonquin Bluffs Area of Natural and Scientific Interest

Plant Community	Approximate Size (ha)	Relative Size (%)
WETLAND VEGETATION TYPE	134	25
Non-forested Wetland	5	1
1. **Open Water** - Beaver Pond	< 1	< 1
2. **Emergent Marsh/Meadow Marsh**	4	1
Forested Wetland	129	24
3. **Conifer Swamp**)		
4. **Mixed Swamp**)	91	17
a. Mature)		
b. Successional	25	5
5. **Deciduous Swamp**	6	1
a. Red Maple - White Elm	5	1
b. Successional Paper Birch - Trembling Aspen	1	< 1
c. Manitoba Maple - Basswood	< 1	< 1
UPLAND VEGETATION TYPE	363	67
Upland Deciduous Forest	329	61
6. **Mesic**	134	25
a. Rich Sugar Maple	42	8
b. Sugar Maple - Beech - Red Maple)		
c. Successional Large-toothed Aspen -)	64	12
Sugar Maple - Beech - Red Maple)		
d. Successional Large-toothed Aspen - Red Maple - Sugar Maple	29	5
7. **Dry Mesic**	47	9
a. Beech - Sugar Maple - Red Maple	19	4
b. Sugar Maple - Red Oak	6	1
c. Successional Large-toothed Aspen - Sugar Maple - Red Oak	13	2
d. Beech - Red Oak	2	< 1
e. Successional Trembling Aspen/Paper Birch	4	1
8. **Dry**	148	27
a. Red Oak)	148	27
b. Successional Large-toothed Aspen - Red Oak)		
Upland Mixed Forest	34	6
9. **Mesic**	17	3
a. Hemlock - Sugar Maple	12	2
b. Sugar Maple - Hemlock	5	1
10. **Dry Mesic**	17	3
a. White Cedar	7	1
b. Successional White Pine - Trembling Aspen	2	< 1
c. Successional Large-toothed Aspen - White Pine/White Cedar	9	2
d. Red Maple - White Pine	1	< 1
ANTHROPOGENIC VEGETATION TYPE	42	8
11. **Conifer Plantation**	3	< 1
12. **Upland Field**	38	7
13. **Disturbed**	1	< 1
Total Area:	539	

Figure 2: Four Vegetation Profiles of Allandale Lake Algonquin Bluffs Area of Natural and Scientific Interest



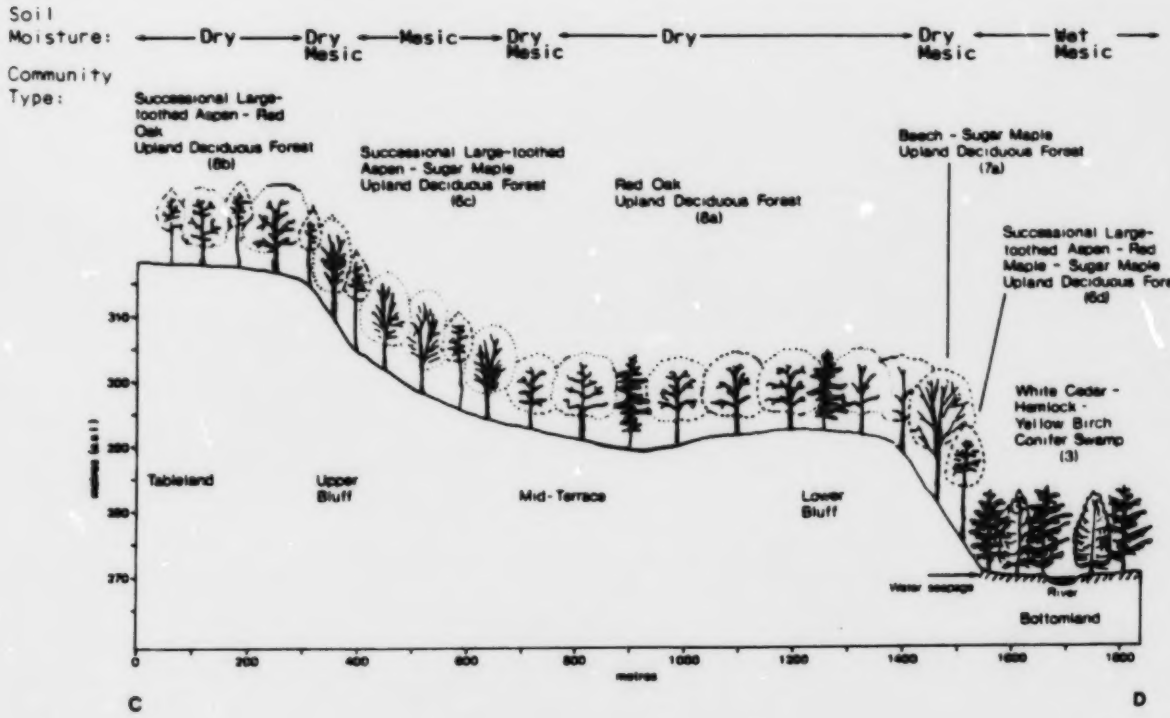
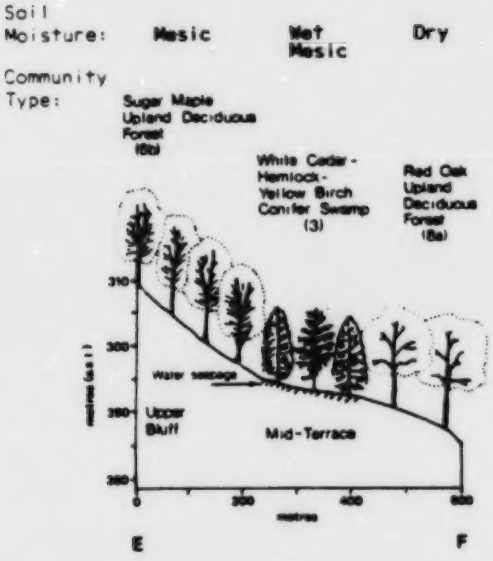


Figure 2 (continued)



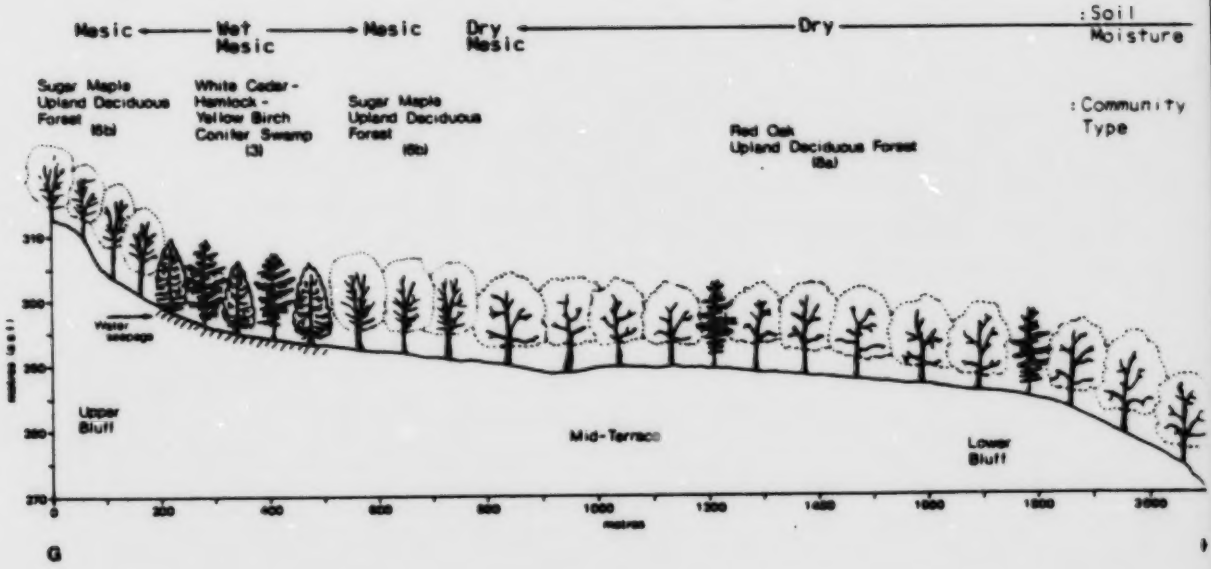


Figure 3: Vegetation Matrix for the Allandale Lake Algonquin Bluffs Area of Natural and Scientific Interest

Temp. / Substrate	Moisture regime	Arid	Very Dry	Dry	Dry Mesic	Mesic	Wet Mesic	Wet	Very Wet	Sat-urated	Open Water
Colder	Rock										
	Sand			8a,b,11, 12,13a	7a-d,10a, c,d,11,12	6b-d, 9a,b,11					
	Loam					4a,5c, 6a,9a	2,4a, 5c				
	Clay										
	Organic						3,4a,b, 5a,b,13a	2,3, 4b	2	2	1
Normal	Rock										
	Sand			8a,b, 11,12	7a-c,10a, 11,12	6b,c, 9a					13b
	Loam					6a					
	Clay										
	Organic										
Warmer	Rock										
	Sand			8a,b, 11,12	7a-c, 10b	6b,c					
	Loam										
	Clay										
	Organic										

Figure 3: Vegetation Matrix for the Allandale Lake Algonquin Bluffs Area of Natural and Scientific Interest (Cont'd)

LEGEND

1. **Open Water** - Beaver Pond
2. **Emergent Marsh/Meadow Marsh**
3. **Conifer Swamp**
4. **Mixed Swamp**
   a. Mature
   b. Successional
5. **Deciduous Swamp**
   a. Red Maple - White Elm
   b. Successional Paper Birch - Trembling Aspen
   c. Manitoba Maple - Basswood
6. **Mesic Upland Deciduous Forest**
   a. Rich Sugar Maple
   b. Sugar Maple - Beech - Red Maple
   c. Successional Large-toothed Aspen - Sugar Maple - Beech - Red Maple
   d. Successional Large-toothed Aspen - Red Maple - Sugar Maple
7. **Dry Mesic Upland Deciduous Forest**
   a. Beech - Sugar Maple - Red Maple
   b. Sugar Maple - Red Oak
   c. Successional Large-toothed Aspen - Sugar Maple - Red Oak
   d. Beech - Red Oak
   e. Successional Trembling Aspen/Paper Birch
8. **Dry Upland Deciduous Forest**
   a. Red Oak
   b. Successional Large-toothed Aspen - Red Oak
9. **Mesic Upland Mixed Forest**
   a. Hemlock - Sugar Maple
   b. Sugar Maple - Hemlock
10. **Dry Mesic Upland Mixed Forest**
    a. White Cedar
    b. Successional White Pine - Trembling Aspen
    c. Successional Large-toothed Aspen - White Pine/White Cedar
    d. Red Maple - White Pine
11. **Conifer Plantation**
12. **Upland Field**
13. **Disturbed**
    a. Borrow Pit
    b. Manmade Pond

WETLAND VEGETATION TYPES

1. Open Water - Beaver Pond

Flooded beaver impoundments are rare in Allandale, restricted to the permanent stream along its northwest corner. In this area, beavers created 3 small ponds sometime after 1978. The beavers flooded out a conifer swamp of White Cedar (*Thuja occidentalis*) and Balsam Fir (*Abies balsamea*); standing dead trees of these species are still common. An aquatic flora has yet to develop in this young community.

2. Emergent Marsh/Meadow Marsh

Marshes are rare in Allandale, being confined to isolated springs and streamside habitats. There are 9 small examples on the extensive wetland in the western part, 1 in the central and 4 in the eastern section of the study area. These marshes are maintained in a non-forested state because they are too wet or experience too great a fluctuation in water levels. Logging disturbance may also have played a role in creating a few of the meadow marshes, especially the drier types.

Streamside meadow marshes periodically flooded in the spring or occasionally during summer storms have a herbaceous cover of: Ostrich Fern (*Matteuccia struthiopteris*), Wild Red Raspberry (*Rubus strigosus*) and Sensitive Fern (*Onoclea sensibilis*), with scattered trees of Manitoba Maple (*Acer negundo*) and Basswood (*Tilia americana*).

Meadow marshes less frequently flooded are dominated by such herbaceous species as: Canada Goldenrod (*Solidago canadensis*), Field Horsetail (*Equisetum arvense*), Spotted Joe-Pye Weed (*Eupatorium maculatum*) and Red-stemmed Aster (*Aster puniceus*). There are scattered trees/ saplings of White Elm (*Ulmus americana*), Yellow Birch (*Betula alleghaniensis*), Balsam Fir (*Abies balsamea*), Basswood (*Tilia americana*), White Cedar (*Thuja occidentalis*) and the occasional shrub of Pussy Willow (*Salix discolor*).

These streamside meadow marshes have a colder-than-normal microclimate and the soils consist of silts or loams with a thick A1 layer. The soil moisture regime is mesic to wet mesic, but it can fluctuate dramatically during the course of a year.

In contrast, water seeping from the Allandale bluffs can sustain permanently moist, streamside or isolated marshes.

On very wet to saturated sites there are emergent marshes dominated by Common Cattail (*Typha latifolia*) and, to a lesser extent, such Sedges as *Carex rostrata* and *Carex stricta*. Spotted Joe-Pye Weed (*Eupatorium maculatum*) and Spotted Jewelweed (*Impatiens capensis*) are important secondary species. In some areas, Sphagnum moss is prominent and it is associated with such fen species as Bog Goldenrod (*Solidago uliginosa*), Round-leaved Sundew (*Drosera rotundifolia*) and a Sedge (*Carex flava*).

Spring-fed creeks can have a saturated community of Spotted Jewelweed (*Impatiens capensis*), Water-cress (*Nasturtium microphyllum*) and Bittersweet (*Solanum dulcamara*).

Wet sites support meadow marshes variously dominated by Red-stemmed Aster (*Aster puniceus*), a Sedge (*Carex scabrata*), Fowl Manna Grass (*Glyceria striata*), Sensitive Fern (*Onoclea sensibilis*) and Spotted Joe-Pye Weed (*Eupatorium maculatum*). Important secondary species include: Spotted Jewelweed (*Impatiens capensis*) and a Willowherb (*Epilobium ciliatum*). Shrubs such as Red-osier Dogwood (*Cornus stolonifera*) and Common Elder (*Sambucus canadensis*) occur in scattered patches.

Wet mesic sites sustain a herbaceous cover of Scouring-rush (*Equisetum hyemale*), Sensitive Fern (*Onoclea sensibilis*) and Spotted Joe-Pye Weed (*Eupatorium maculatum*).

Soils in these seepage marshes are organic mucks and the microclimate is warmer-than-normal.

Significant species: a Clearweed (*Pilea fontana*).

Swamps

Swamps are the third most common vegetation types in the study area. Most stands are situated on lowlands and valley bottomlands along the base of the Allandale bluffs. The rest occur as linear, mid-terrace stands below the upper bluffs. In most of these swamps, water seeping out from underground aquifers maintain perpetually moist conditions.

All swamp communities at Allandale have colder-than-normal microclimates.

3. Conifer Swamp

The most common swamp category in Allandale is an amalgam of a number of conifer communities which differ in maturity, dominant tree species and soil moisture. One community grades almost imperceptibly into another, making it difficult to delineate each community at the 1:10,000 mapping scale.

Wet to wet mesic sites on organic soils maintained by seepage have forests of White Cedar (*Thuja occidentalis*) with such secondary associates as Hemlock (*Tsuga canadensis*), Yellow Birch (*Betula alleghaniensis*), Balsam Fir (*Abies balsamea*) and, less frequently, Red Maple (*Acer rubrum*). Younger forests have a significant component of Paper birch (*Betula papyrifera*), Balsam Poplar (*Populus balsamifera*) and White Elm (*Ulmus americana*).

Wet mesic to mesic sites on organic or occasionally on loamy soils maintained to a lesser extent by seepage have forests of Hemlock (*Tsuga canadensis*) with such strong secondary associates as White Cedar (*Thuja occidentalis*) and Yellow Birch (*Betula alleghaniensis*). Minor tree species include: Red Maple (*Acer rubrum*), Basswood (*Tilia americana*) and Sugar Maple (*Acer saccharum*).

In all stands, White Cedar (*Thuja occidentalis*) and Hemlock (*Tsuga canadensis*) are also prominent in the sapling layer, while Mountain Maple (*Acer spicatum*) and Americana Yew (*Taxus canadensis*) occur as scattered shrubs.

On wetter sites, the following herbaceous species are common: Foamflower (*Tiarella cordifolia*), Naked Mitrewort (*Mitella nuda*), Field Horsetail (*Equisetum arvense*), a Sedge (*Carex scabrata*), Dwarf Raspberry (*Rubus pubescens*), Bulblet Fern (*Cystopteris bulbifera*), Glandular Wood Fern (*Dryopteris intermedia*), Fowl Manna Grass (*Glyceria striata*), Goldthread (*Coptis trifolia*) and Twinflower (*Linnaea borealis*). In contrast, drier sites are dominated by the following herbaceous species: Glandular Wood Fern (*Dryopteris intermedia*), Foamflower (*Tiarella cordifolia*), Wild Ginger (*Asarum canadense*), a Sedge (*Carex scabrata*), Bluebead-lily (*Clintonia borealis*), Wild Sarsaparilla (*Aralia nudicaulis*) and White Snakeroot (*Eupatorium rugosum*).

Some of the stands have been lightly logged, a few have been heavily logged; one as recently as the 1970's.

Significant species: a Sedge (*Carex prasina*),
Flowering Raspberry (*Rubus odoratus*) and
a Clearweed (*Pilea fontana*)

4. Mixed Swamp

a. Mature Mixed Swamp

This community type is confined to the extensive wetland in the western part of Allandale. Red Maple (*Acer rubrum*) is the major species in these forests, however, Sugar Maple (*Acer saccharum*) and Yellow Birch (*Betula alleghaniensis*) can also dominate. Conifer trees such as White Cedar (*Thuja occidentalis*), Hemlock (*Tsuga canadensis*), and to a lesser extent, Balsam Fir (*Abies balsamea*) are important associates. Occasionally, Basswood (*Tilia americana*), a deciduous tree, is also a strong associate. In contrast, Sugar Maple (Acer saccharum) dominates the reproductive layer with Red Maple, Balsam Fir and Hemlock secondary associates. Ground Yew (*Taxus canadensis*) and Mountain Maple (Acer spicatum) form a discontinuous shrub layer. Common herbaceous species include: Blue-bead Lily (*Clintonia borealis*), Glandular Wood Fern (*Dryopteris intermedia*), Wild Sarsaparilla (*Aralia nudicaulis*) and a Sedge (*Carex pedunculata*).

Soil moisture ranges between mesic and wet mesic, and soil type is organic or occasionally loam.

b. Successional Mixed Swamp

This assemblage of successional communities is mainly located at the northern tip of the extensive wetland in the western portion of Allandale with 2 additional stands in the eastern part of the ANSI. Soil moisture varies from wet mesic to mesic and the soils range from organics to loams.

On mesic sites Trembling Aspen (*Populus tremuloides*), Balsam Fir (*Abies balsamea*) and to lesser extent Red Maple (*Acer rubrum*) dominate the tree layer, with Paper Birch (*Betula papyrifera*) occasionally a secondary dominant. Conifer species such as White Cedar (*Thuja occidentalis*) and Hemlock (*Tsuga canadensis*) are also important associates or form small enclaves. In contrast, the reproductive layer is dominated by Balsam Fir (*Abies balsamea*) and all the other tree species noted above (with the exception of Trembling Aspen and Paper Birch) are important secondary associates.

Small wetter pockets are scattered throughout the predominant mesic communities. Here one finds forests of Trembling Aspen and such associates as White Cedar and Balsam Fir. Prevalent in the understory is: Red-osier Dogwood (*Cornus stolonifera*), Fowl Manna Grass (*Glyceria striata*), Sensitive Fern (*Onoclea sensibilis*) and Dwarf Raspberry (*Rubus pubescens*).

Some wetter pockets are maintained moist throughout the year by water seepage. These sites support young White Cedar forests and a scattering of Balsam fir, Paper Birch, Trembling Aspen and Hemlock. The understory flora is similar to those outlined in the more mature conifer swamps of community type 3.

These communities have originated after disturbance by logging. The oldest communities appear to be about 50 years old.

5. Deciduous Swamp

a. Red Maple - White Elm

There is one swamp dominated by Red Maple (*Acer rubrum*) and White Elm (*Ulmus americana*) in the western part of Allandale. Other tree species in this young forest include: Yellow Birch (*Betula alleghaniensis*), Balsam Poplar (*Populus balsamifera*) and to a lesser extent, Balsam Fir (*Abies balsamea*), Paper Birch (*Betula papyrifera*) and White Cedar (*Thuja occidentalis*). Red Maple continues to dominate in the reproductive layer, but this time in combination with Sugar Maple (*Acer saccharum*). Mountain Maple (*Acer spicatum*) forms a common shrub layer while the

herbaceous layer consists of: Glandular Wood Fern (*Dryopteris intermedia*), Sweet Cicely (*Osmorhiza claytonii*), Foamflower (*Tiarella cordifolia*) and White Snakeroot (*Eupatorium rugosum*).

The soils are wet mesic organics or loams.

b. Successional Paper Birch - Trembling Aspen

These young forests of Paper Birch (*Betula papyrifera*) and Trembling Aspen (*Populus tremuloides*) are restricted to 4 small springs emerging from the base of the upper bluffs in the eastern half of Allandale. Secondary tree species include: White Pine (*Pinus strobus*), Balsam Poplar (*Populus balsamifera*), Red Maple (*Acer rubrum*), Basswood (*Tilia americana*) and Yellow Birch (*Betula alleghaniensis*).

The understory is characterized by dense swards of Scouring-rush (*Equisetum hyemale*). Other prevalent herbaceous species consist of: Rough Goldenrod (*Solidago rugosa*), Red-stemmed Aster (*Aster puniceus*), Spotted Joe-Pye Weed (*Eupatorium maculatum*), Sensitive Fern (*Onoclea sensibilis*), Field Horsetail (*Equisetum arvense*) and Spotted Jewelweed (*Impatiens capensis*).

The community has originated following logging.

The soils are wet mesic sands.

Significant species: Flowering Raspberry (*Rubus odoratus*)

c. Manitoba Maple - Basswood

Forests of Manitoba Maple (*Acer negundo*) and Basswood (*Tilia americana*) are rare in Allandale, being restricted to a small area of bottomland in its southwestern corner. The community occurs as small wooded patches in a meadow of Ostrich Fern (*Matteuccia struthiopteris*), Wild Red Raspberry (*Rubus strigosus*) and Sensitive Fern (*Onoclea sensibilis*). These meadow species also dominate the forest understory. Both communities exhibit evidence of disturbance by man.

The soils are wet mesic loams which are periodically subjected to sediment deposition during floods.

UPLAND VEGETATION TYPES

Upland Deciduous Forest

6. Mesic Upland Deciduous Forest

These mesic forests represent the second most common vegetation category in the study area. They are largely restricted to 2 locations on the Allandale bluffs: (1) the gradual lower slopes and associated valley bottomlands abutting the swamps, and (2) upper slopes facing mainly in the northwest to northeast directions.

a. Rich Sugar Maple

Rich slopes dominated by Sugar Maple (*Acer saccharum*) are largely confined to the western section of the study area, with 4 smaller stands occurring to the east. The forests also sustain scattered trees of Basswood (*Tilia americana*), Beech (*Fagus grandifolia*), White Ash (*Fraxinus americana*), Butternut (*Juglans cinerea*) and Black Cherry (*Prunus serotina*). On younger sites, Large-toothed Aspen (*Populus grandidentata*) and/or Paper Birch (*Betula papyrifera*) is a common associate.

In the understory, Sugar Maple forms a continuous reproductive layer while a shrub layer is absent. There is a rich diversity of herbaceous species, especially vernal ones. The most prevalent include: Yellow Trout Lily (*Erythronium americanum*), Squirrel corn (*Dicentra canadensis*), Wild Leek (*Allium tricoccum*), Common Trillium (*Trillium grandiflorum*), Canada Violet (*Viola canadensis*), Wild Ginger (*Asarum canadense*), Blue Cohosh (*Caulophyllum thalictroides*), Glandular Wood Fern (*Dryopteris intermedia*), Virginia Waterleaf (*Hydrophyllum virginianum*), Jack-in-the-Pulpit (*Arisaema triphyllum*), Yellow Violet (*Viola pubescens*), May-apple (*Podophyllum peltatum*), Marginal Wood Fern (*Dryopteris marginalis*), Sweet Cicely (*Osmorhiza claytonii*) and Enchanter's Nightshade (*Circaea lutetiana*) and a Sedge (*Carex pedunculata*).

A number of the herbaceous species are restricted within Allandale to these rich forests (e.g. the Sedges *Carex albursina* and *Carex hitchcockiana*, Canada Violet (*Viola canadensis*), Woodland Poa (*Poa alsodes*), American Ginseng (*Panax quinquefolium*) and Black Snakeroot (*Sanicula trifoliata*).

The soils are mesic loams and loamy sands. There is typically an 8 to 12 cm thick A1 layer of sandy loam above a B layer of sand. The microclimate varies from normal to colder-than-normal, with most stands situated on cooler sites.

Significant species: Woodland Poa (*Poa alsodes*), Black Snakeroot (*Sanicula trifoliata*) and the provincially rare/nationally threatened American Ginseng (*Panax quinquefolium*)

b. Sugar Maple - Beech - Red Maple
and **c. Successional Large-toothed Aspen - Sugar Maple -Beech - Red Maple**

These communities are restricted to the eastern half of the study area. The older stands have a tree strata of Sugar Maple (*Acer saccharum*) with Beech (*Fagus grandifolia*) and Red Maple (*Acer rubrum*) frequently important secondary species. The latter species is most common on gradual slopes, while Beech is most plentiful on steep slopes. Younger stands have Large-toothed Aspen (*Populus grandidentata*) as a co-dominant, and occasionally it becomes the major species. Minor tree associates in all stands include: Red Oak (*Quercus rubra*), Basswood (*Tilia americana*), White Ash (*Fraxinus americana*), Black Cherry (*Prunus serotina*), Hemlock (*Tsuga canadensis*) and Paper Birch (*Betula papyrifera*). In the reproductive layer, Sugar Maple continues to be the important species, while Beech and Red Maple are minor associates.

Prominent in the understory are: Wild Lily-of-the-Valley (*Maianthemum canadense*), Common Trillium (*Trillium grandiflorum*), Solomon's-seal (*Polygonatum pubascens*) and less frequently Rough-leaved Mountain-rice (*Oryzopsis asperifolia*), a Sedge (*Carex pedunculata*), the shrub Maple-leaved Viburnum (*Viburnum acerifolium*), Glandular Wood Fern (*Dryopteris intermedia*) and Partridge-berry (*Mitchella repens*). In contrast to the rich forests of community type 6a. vernal species such as Yellow Trout Lily (*Erythronium americanum*) are rare in these forests.

The younger stands have originated following logging.

Soils are mesic sands with a tendency towards dry mesic conditions. The microclimate varies from colder to warmer-than-normal, but most stands are situated on cooler sites.

Significant species: a Sedge (*Carex platyphylla*) and Allandale's largest colony of the provincially rare/nationally threatened American Ginseng (*Panax quinquefolium*) - a total of 55 individuals.

d. Successional Large-toothed Aspen - Red Maple - Sugar Maple

These forests are restricted to the lowest slopes and valley bottomlands abutting the conifer swamps. Most of the stands are dominated by Large-toothed Aspen (*Populus grandidentata*) with Red Maple (*Acer rubrum*) and Sugar Maple (*Acer saccharum*) important secondary species. These

latter species occasionally co-dominate in older stands. Some of the young stands also have Paper Birch (*Betula papyrifera*) and Trembling Aspen (*Populus tremuloides*) as important associates. Minor tree associates include: Butternut (*Juglans cinerea*), White Ash (*Fraxinus americana*), Black Cherry (*Prunus serotina*) and Red Oak (*Quercus rubra*). In all stands, Red Maple and Sugar Maple co-dominate the reproductive layer with Balsam Fir (*Abies balsamea*) occasionally an important secondary species.

Prominent in the understory are: Wild Lily-of-the-Valley (*Maianthemum canadense*), Rough-leaved Mountain-rice (*Oryzopsis asperifolia*), Partridge-berry (*Mitchella repens*), Maple-leaved Viburnum (*Viburnum acerifolium*), Bracken Fern (*Pteridium aquilinum*), Common Trillium (*Trillium grandiflorum*), Solomon's-seal (*Polygonatum pubescens*), Shinleaf (*Pyrola elliptica*) and Fringed Polygala (*Polygala paucifolia*).

Many of the young stands have colonized former logging trails and roads.

Soils are mesic and occasionally dry mesic sands. The microclimate is colder-than-normal.

Significant species: a Bush Clover (*Lespedeza capitata*) - along a trail, and Flowering Raspberry (*Rubus odoratus*)

7. Dry Mesic Upland Deciduous Forest

a. Beech - Sugar Maple - Red Maple

This common community type is found in the central and eastern portions of Allandale. Its 15 stands are located on lower to mid-slopes and they are most prevalent on steeper slopes.

In older stands, Beech (*Fagus grandifolia*) and Sugar Maple (*Acer saccharum*) co-dominate in the tree and reproductive layers with Red Maple (*Acer rubrum*) a strong secondary species. Other important associates include Red Oak (*Quercus rubra*) and to a lesser extent, White Ash (*Fraxinus americana*). The younger stands have Large-toothed Aspen (*Populus grandidentata*) as a secondary dominant in the tree layer. Common in the understory are: Rough-leaved Mountain-rice (*Oryzopsis asperifolia*), Maple-leaved Viburnum (*Viburnum acerifolium*), Beech-drops (*Epifagus virginiana*) and less frequently, a Sedge (*Carex pedunculata*) and Marginal Wood Fern (*Dryopteris marginalis*).

The younger stands have originated following logging.

Soils are dry mesic sands and the microclimate varies from warmer to colder-than-normal.

b. Sugar Maple - Red Oak
and **c. Successional Large-toothed Aspen - Sugar Maple - Red Oak**

This amalgam of communities is common in the central part of the study area. It occupies the lower slopes between the moister bottomlands and the dry forests of the upper slopes and knolls.

The older stands are dominated by Sugar Maple (*Acer saccharum*) in both the tree and reproductive layers with Red Oak (*Quercus rubra*) a strong secondary species. Minor associates include: Beech (*Fagus grandifolia*), Red Maple (*Acer rubrum*), White Ash (*Fraxinus americana*), Basswood (*Tilia americana*) and Black Cherry (*Prunus serotina*). Younger stands have Large-toothed Aspen (*Populus grandidentata*) as a co-dominant or even the major tree species. Most prevalent in the understory are: Rough-leaved Mountain-rice (*Oryzopsis asperifolia*), a Sedge (*Carex pedunculata*), Maple-leaved Viburnum (*Viburnum acerifolium*) and Partridge-berry (*Mitchella repens*).

The younger stands have originated following logging.

Soils are dry mesic sands and the microclimate varies from colder to warmer-than-normal.

d. Beech - Red Oak

This community is restricted to 5 small enclaves in the central part of the study area. Four of the stands are located in the midst of a dry Red Oak forest while the 5th stand is situated on a narrow ridge.

The tree canopy consists of Beech (*Fagus grandifolia*) and Red Oak (*Quercus rubra*) with a scattering of Red Maple (*Acer rubrum*) and Sugar Maple (*Acer saccharum*). In contrast, the reproductive layer is dominated only by Beech, while Sugar Maple, and less frequently Red Maple, are secondary species. Common understory species include: Rough-leaved Mountain-rice (*Oryzopsis asperifolia*) and the shrub Maple-leaved Viburnum (*Viburnum acerifolium*).

Soils are dry mesic sands and the microclimate is warmer-than-normal.

e. Successional Trembling Aspen/Paper Birch

This assemblage of young successional forests is confined to forest edges, particularly those around former pastures and pine plantations.

The 6 stands are dominated by Trembling Aspen (*Populus tremuloides*) or a mixture of Trembling Aspen and Paper Birch (*Betula papyrifera*). Large-toothed Aspen (*Populus grandidentata*) is occasionally an important associate. Other tree species are largely confined to the reproductive layer. On moister stands, there is a scattering of Black Cherry (*Prunus serotina*), Red Maple (*Acer rubrum*), Red Oak (*Quercus rubra*), White Ash (*Fraxinus americana*) and Sugar Maple (*Acer saccharum*). In contrast, drier stands have a scattering of Red Oak (*Quercus rubra*) and White Pine (*Pinus strobus*).

Common understory species vary according to the soil moisture. Mesic sites sustain such species as: Common Blackberry (*Rubus allegheniensis*), Bracken Fern (*Pteridium aquilinum*), Wild Red Raspberry (*Rubus strigosus*), a Sedge (*Carex pedunculata*) and Strawberry (*Fragaria virginiana*). Most prevalent on drier sites are: Bracken Fern (*Pteridium aquilinum*), Canada Blue Grass (*Poa compressa*) and Rough-leaved Mountain-rice (*Oryzopsis asperifolia*).

Most of these stands have colonized former pastures.

Soils are dry mesic and occasionally mesic sands. The microclimate varies from normal to colder-than-normal.

Significant species: a Bush Clover (*Lespedeza capitata*) along a foot trail

8. Dry Upland Deciduous Forest

a. Red Oak

and **b. Successional Large-toothed Aspen - Red Oak**

Dry upland forests are the most common vegetation category on the Allandale bluffs. Absent from the richer soils in the western portion of the study area, dry forests are elsewhere prominent on lower to mid-slopes, isolated knolls/terraces, ridges/rims and the tablelands above the bluffs.

The older stands have a tree canopy of Red Oak (*Quercus rubra*) and a scattering of such associates as: Sugar Maple (*Acer saccharum*), Beech (*Fagus grandifolia*), White Pine (*Pinus strobus*), Ironwood (*Ostrya virginiana*) and Red Maple (*Acer rubrum*). Steep southwest-facing slopes and isolated mid-slope terraces/knolls can become excessively drained and approach very

dry conditions. On these sites, Red Oak is almost monodominant or it has White Pine and, less frequently, Beech as secondary associates. Reproduction here is mainly Red Oak and White Pine. On dry rims and isolated narrow ridges, Red Oak is most commonly associated with Ironwood.

In contrast, most of the oak forests exhibit a tendency towards dry mesic conditions. On these sites, Sugar Maple and, to a lesser extent, Beech become more prominent in the tree layer and Sugar Maple dominates the reproductive layer.

About one-third of the oak forests are relatively young with Large-toothed Aspen (*Populus grandidentata*) co-dominating or even dominating the stand. Occasionally, Paper Birch (*Betula papyrifera*) and Trembling Aspen (*Populus tremuloides*) are secondary associates. The other tree species follow a similar pattern to those described above for the mature stands.

Prevalent in the understory of the mature forests are: Rough-leaved Mountain-rice (*Oryzopsis asperifolia*), Maple-leaved Viburnum (*Viburnum acerifolium*), Chokecherry (*Prunus virginiana*), Wild Lily-of-the-Valley (*Maianthemum canadense*), a Sedge (*Carex pedunculata*), Blue-stem Goldenrod (*Solidago caesia*), Bush Honeysuckle (*Diervilla lonicera*), Bracken Fern (*Pteridium aquilinum*) and Round-leaved Dogwood (*Cornus rugosa*). The latter two species are most prominent on the drier sites, while *Solidago caesia* and *Carex pedunculata* are more plentiful in stands approaching dry mesic conditions.

The younger stands have a similar understory composition, however the more open canopy allows species typical of field habitats to gain a foothold. These include: Canada Blue Grass (*Poa compressa*), Poison-ivy (*Rhus radicans*), Staghorn Sumac (*Rhus typhina*) and Common Blackberry (*Rubus allegheniensis*). Moreover, Bracken Fern (*Pteridium aquilinum*) is much more prominent, forming dense swards.

Soils are dry sands with some tendency towards dry mesic conditions. The microclimate varies from warmer to colder-than-normal with most stands on warmer sites.

Most of the successional stands have originated following heavy logging, however some have colonized former pastures. Several mature stands in the northeastern corner of the study area are currently being selectively logged.

Significant species: a Bush Clover (*Lespedeza intermedia*), *Stemless Blue Violet (Viola adunca*), a Tick-trefoil (*Desmodium dillenii*) and Flowering Raspberry (*Rubus odoratus*)
These species are confined to more open habitats. For example, the two former species are restricted to narrow ridges in a semi-closed forest, while *Desmodium dillenii* is located along the edge of a trail. In contrast, another significant species, the sedge (*Carex platyphylla*) occurs in a closed mature forest.

Upland Mixed Forest

9. Mesic Upland Mixed Forest

a. Hemlock - Sugar Maple

This community is largely confined to steep upper slopes (10 stands) facing in directions ranging from west to north, with most of a northerly aspect. Other examples are situated on valley floors (3 stands), a steep lower slope with a northeast aspect (1 stand), steep valley slopes (2 stands), lower terraces (3 stands) and a north-facing mid-slope (1 stand).

Most of the Hemlock (*Tsuga canadensis*) stands are associated with conifer swamps fed by water seeping from underground aquifers. Hemlock's preference for dependably moist soils may explain this association.

On slopes and terraces, the common tree species occurring with the dominant Hemlock are Sugar Maple (*Acer saccharum*), Beech (*Fagus grandifolia*) and less frequently, Red Maple (*Acer rubrum*). Beech tends to be more important on stands with a tendency towards dry mesic conditions. On less mature sites, Paper Birch (*Betula papyrfiera*) is an important associate. Minor tree species, especially on drier sites, include: Red Oak (*Quercus rubra*) and Ironwood (*Ostrya virginiana*). In most stands, Hemlock also dominates the reproductive layer, however Sugar Maple can be a major species on terrace stands. More typically, Sugar Maple is an important secondary species.

On the terrace stand in the western corner of Allandale, the dominant understory species are: American Yew (*Taxus canadensis*), Glandular Wood Fern (*Dryopteris intermedia*), Blue Cohosh (*Caulophyllum thalictroides*), Wild Ginger (*Asarum canadense*) and Yellow Trout Lily (*Erythronium americanum*).

In contrast, the hemlock slopes have a relatively depauperate understory flora. Major species are: Glandular Wood Fern (*Dryopteris intermedia*) and a Sedge (*Carex pedunculata*).

The Hemlock forests on valley floors typically have Sugar Maple and Red Maple as secondary species, while Beech is no longer a prevalent component of the tree layer. The moister examples have a rich understory flora of: Glandular Wood Fern (*Dryopteris intermedia*), Bearded Shorthusk (*Brachyelytrum erectum*) and a Sedge (*Carex pedunculata*).

One stand was heavily logged, sometime in the 1970's.

Soils are mesic sands, or in the case of one of the terrace stands, loams. Several stands exhibit a tendency towards dry mesic conditions. The microclimate is predominantly colder-than-normal with a few stands on normal sites.

Significant species: a Sedge (*Carex platyphylla*)

b. Sugar Maple - Hemlock

This community is restricted to 2 stands in the central part and 1 stand in the western corner of Allandale. They are situated on terraces abutting conifer swamps and in one area extend up a northwest facing slope.

On the terraces, Sugar Maple (*Acer saccharum*) is the major tree with Hemlock (*Tsuga canadensis*) and Red Maple (*Acer rubrum*) important secondary species. These moist sites support a rich understory flora of: American Yew (*Taxus canadensis*), Glandular Wood Fern (*Dryopteris intermedia*), a Clubmoss (*Lycopodium obscurum*) and Partridge-berry (*Mitchella repens*).

The slope forest also has Beech (*Fagus grandifolia*) and Paper Birch (*Betula papyrifera*) in the tree layer. The understory exhibits some dry mesic tendencies being dominated by: Rough-leaved Mountain-rice (*Oryzopsis asperifolia*), Partridge-berry (*Mitchella repens*) and Maple-leaved Viburnum (*Viburnum acerifolium*).

Soils are mesic sands and the microclimate is colder-than-normal.

10. Dry Mesic Upland Mixed Forest

a. White Cedar

This community is rare in Allandale, being restricted to steep northeast to northwest facing slopes (5 stands) and a terrace abutting conifer swamps (l stand). Most of the examples are located in the western portion of Allandale.

On mature slopes, White Cedar (*Thuja occidentalis*) is associated with Hemlock (*Tsuga canadensis*) and/or with such deciduous trees as: Sugar Maple (*Acer saccharum*), Red Oak (*Quercus rubra*), Red Maple (*Acer rubrum*) and White Ash (*Fraxinus americana*). More successional examples have Trembling Aspen (*Populus tremuloides*) and Paper Birch (*Betula papyrifera*) as important tree associates.

On the terrace stand, White Cedar is almost monodominant, with only a scattering of White Spruce (*Picea glauca*), Balsam Fir (*Abies balsamea*) and Paper Birch (*Betula papyrifera*). In all stands, White Cedar dominates the reproductive layer, and Sugar Maple, Balsam Fir and Hemlock can be important secondary species.

The understory is sparse in the mature coniferous stands, consisting of: Marginal Wood Fern (*Dryopteris marginalis*) and Fringed Polygala (*Polygala paucifolia*). In contrast, the White Cedar - deciduous stands have a richer understory flora of: Marginal Wood Fern (*Dryopteris marginalis*), a Sedge (*Carex pedunculata*) and American Yew (*Taxus canadensis*). The successional stands have an understory of: Bracken Fern (*Pteridium aquilinum*), Crowfoot Clubmoss (*Lycopodium digitatum*) and Wild Lily-of-the-Valley (*Maianthemum canadense*).

The more successional stands have originated following logging.

Soils are dry mesic sands with some tendency towards mesic conditions. The microclimate is largely colder-than-normal, with one stand situated on a normal site.

b. Successional White Pine - Trembling Aspen

This successional community is rare in Allandale, being restricted to slopes and knolls ringing the conifer swamp in the northwest corner of Allandale.

White Pine (*Pinus strobus*) and Trembling Aspen (*Populus tremuloides*) form a relatively open tree layer. Secondary tree species include: Balsam Fir (*Abies balsamea*) and/or Paper Birch (*Betula papyrifera*). White Spruce (*Picea glauca*), Red Maple (*Acer rubrum*), Red Oak (*Quercus rubra*) and Black Cherry (*Prunus serotina*) are minor tree species. In contrast, Balsam Fir dominates the reproductive layer. Prominent in the understory are: Bracken Fern (*Pteridium aquilinum*) and Rough-leaved Mountain-rice (*Oryzopsis asperifolia*).

Some stands have originated following logging, however most have colonized former pastures.

Soils are dry mesic sands and the microclimate is warmer-than-normal.

c. Successional Large-toothed Aspen - White Pine/ White Cedar

This amalgam of successional forest communities are restricted to 4 stands in the eastern half of Allandale. All stands are dominated by Large-toothed Aspen (*Populus grandidentata*), but there is variation in the important secondary tree species. The associates in order of importance for each of the 4 stands include: White Pine - White Cedar, White Pine - Red Oak, White Pine - Paper Birch and White Cedar - Red Oak - White Pine. These secondary species dominate the reproductive layer. Common understory species include: Bracken Fern (*Pteridium aquilinum*) and Rough-leaved Mountain-rice (*Oryzopsis asperifolia*).

Some stands have originated following logging, however most have colonized former pastures.

Soils are dry mesic sands with one stand exhibiting a tendency toward dry conditions. The microclimate varies from colder to warmer-than-normal.

d. Red Maple - White Pine

This community is restricted to a north-facing upper slope in the southcentral part of the study area. Red Maple (*Acer rubrum*) and White Pine (*Pinus strobus*) are the major tree species with a scattering of: White Ash (*Fraxinus americana*), Sugar Maple (*Acer saccharum*) and Black Cherry (*Prunus serotina*). Red Maple and Sugar Maple dominate the reproductive layer.

Soils are dry mesic sands and the microclimate is colder-than-normal.

ANTHROPOGENIC VEGETATION TYPES

11. Conifer Plantation

Small conifer plantations are scattered through the lower slopes in the central and eastern portions of Allandale. Planted mostly in Red Pine (*Pinus resinosa*), some plantations also contain Jack Pine (*Pinus banksiana*) or Red Pine/White Pine (*Pinus strobus*) admixtures. Large Scotch Pine (*Pinus sylvestris*) plantations occur outside the northeast corner of the study area.

12. Upland Field

Upland fields are scattered throughout Allandale. They are situated on former pastures, a cut along Road 31 and an adjacent pipeline-right-of-way.

The older pastures have dense thickets of: Staghorn Sumac (*Rhus typhina*), scattered young copses of Trembling Aspen (*Populus tremuloides*) and White Pine (*Pinus strobus*). Low shrubs of Wild Red Raspberry (*Rubus strigosus*) form a patchy layer.

In all stands, Poverty Oat Grass (*Danthonia spicata*) is the most common graminoid species. Other important graminoid associates include: Canada Blue Grass (*Poa compressa*), Sand Dropseed (*Sporobolus cryptandrus*), Kentucky Blue Grass (*Poa pratensis*) and less frequently, a Sedge (*Carex foenea*), Redtop (*Agrostis gigantea*) and Quack Grass (*Agropyron repens*). Prevalent herbaceous species include: Gray Goldenrod (*Solidago nemoralis*), Strawberry (*Fragaria virginiana*), Bracken Fern (*Pteridium aquilinum*), Canada Goldenrod (*Solidago canadensis*) and such weedy species as Yarrow (*Achillea millefolium*), Wild Carrot (*Daucus carota*) and Ox-eye Daisy (*Chrysanthemum leucanthemum*).

The fields in the central portion of the study area are noteworthy for their assemblage of prairie species. For instance, hundreds of plants of Bush Clover (*Lespedeza capitata*) and Prairie Cinquefoil (*Potentilla arguta*) occur in several fields (UTM GRID REF.: 31D/5 014097 and 014094) while in another, the Sedge (*Carex foenea*) is a prominent member of the understory (UTM GRID REF.: 31D/5 994094).

Soils are dry to dry mesic sands. The microclimate varies from colder to warmer-than-normal.

Significant species: a Bush Clover (*Lespedeza capitata*), Prairie Cinquefoil (*Potentilla arguta*), a Sedge (*Carex foenea*) and the provincially rare Rugulose Grapefern (*Botrychium rugulosum*). The latter species was collected in 1972 by R.S.W. Bobbette in a moist sandy Bracken Fern (*Pteridium aquilinum*) field at the edge of a Red Pine (*Pinus resinosa*) plantation. It is situated on Conc. IX, Lot 27 along the northwest edge of the ANSI.

13. Disturbed Communities

Highly disturbed communities are rare in Allandale. There is a small abandoned borrow pit in a dry oak forest and an accompanying access road cut through a successional mixed swamp. This disturbed example is located in the northcentral part of the study area. A man-made pond is also situated in the southeast corner of Allandale.

(iii) FLORISTICS

Most of the species at Allandale are typical of those encountered in the Southern Deciduous-Coniferous Region of Maycock (1979). For example, such common Allandale species as Yellow Birch (*Betula alleghaniensis*), Hemlock (*Tsuga canadensis*), White Cedar (*Thuja occidentalis*), White Pine (*Pinus strobus*), Sugar Maple (*Acer saccharum*) and American Yew (*Taxus canadensis*) peak in abundance within this region.

Some species, however, do have southern, northern, prairie or even western affinities (Table 4). There are 11 southern species and 2 northern species at or near the limit of their Ontario range in the study area. The distribution of two of the southern species, which are considered provincially and nationally rare, are illustrated in Appendix B.

Thirteen species are noted to have prairie affinities because they are common on prairies in Ontario (Reznicek, 1983), the Canadian Prairie Provinces (Looman and Best, 1979), or Michigan (Curtis, 1959). Prairie species are largely confined to the Carolinian or Deciduous Forest Region of southwestern Ontario and become less frequent in the Southern Deciduous-Coniferous Forest Region. Relict prairies are rare in the latter region. The best examples occur on the west side of Lake Simcoe (e.g. DeGrassi Point, Holland Landing and the Lake Algonquin bluffs around Kempenfeldt Bay) (Gould, 1986; Reznicek, 1983). These prairies appear to be associated with Indian trails and encampments (Reznicek, 1983).

The study area also supports 2 species mainly centred in the western Cordilleras, with disjunct populations in the Great Lakes - St. Lawrence Region. Allandale is situated on the edge of a high concentration of western disjunct species encompassing the Bruce Peninsula, and to a less extent, the southeast Georgian Bay shore.

(iv) FAUNA

Incidental observations of breeding birds are listed in Appendix C, and those for mammals and amphibians are listed in Appendix D. The fauna of the ANSI is representative of the area, and there were no unexpected species. Further faunal inventories and observations are required to augment those of this report.

Table 4: Geographic Affinities of Vascular Plants in the Allandale Lake Algonquin Bluffs Area of Natural and Scientific Interest

Southern species at or near the limit of their Ontario range in the study area:

Carex laevivaginata
Carex platyphylla
Carex prasina
Desmodium dillenii
Lespedeza capitata
Lespedeza intermedia
Panax quinquefolium
Pilea pumila
Rubus odoratus
Sanicula trifoliata
Solidago caesia

Northern species at or near the limit of their Ontario range in the study area:

Arabis holboellii
Polygonum douglassii

Prairie species:

Anemone cylindrica
Arabis holboellii
Carex foenea
Carex muhlenbergii
Desmodium canadense
Desmodium dillenii
Houstonia longifolia
Lespedeza capitata
Lespedeza intermedia
Potentilla arguta
Sporobolus cryptandrus
Sporobolus neglectus
Viola sagittata

Western disjunct species: (Marquis and Voss, 1981)

Arabis holboellii
Polygonum douglassii

CHAPTER III: PLANNING CONSIDERATIONS

(I) SIGNIFICANT FEATURES

Nine significant areas were delineated during the course of this study, and these are shown on Map 3. A number of vegetation communities outlined in Map 1 were excluded because they are either anthropogenic vegetation types (community types 11, 12 and 13), or young successional forests (community types 4b, 5a,b,c, 7e and 10d). In an effort to produce reasonable boundaries for the significant areas, a few small and isolated stands considered significant, but surrounded by large areas of non-significant communities, were also excluded. Most of the successional forests (community types 6c, 6d, 7c, 8b, 10b and 10c) were retained in the significant designation because they are scattered within more mature forest types. These successional forests are found in the following significant areas: H2, H3, H4, H6 and M1.

The significance of these 9 sites was determined using the criteria outlined in the Revised Report Format (Ontario Ministry of Natural Resources, 1976), a summary of which is presented in Table 5.

Representative value is in the context of the Simcoe Lowlands and Simcoe Uplands Physiographic Regions as defined by Chapman and Putnam (1984) (Site Districts 6-6, 6-7 and 6-8). Comparisons are made with 13 other ANSIs within these two regions. In addition, the degree of disturbance by both present and past activities was included in the assessment of representativeness.

Scientific value was determined by evaluating the site in terms of its potential for ecological and species-specific research. The Allandale ANSI as a whole provides a regionally-unique opportunity for research into the relationship of vegetation to such physical parameters as slope aspect, slope degree, microclimate and soil moisture. All of these parameters occur over a wide range and there are a number of replicates, a prerequisite for scientific research.

The potential of the site for interpreting ecological processes in the context of the region was used for the determination of a combined interpretive and educational value.

A value for significant habitat/features was based on the presence of rare biota (at the regional and provincial levels), and the rarity or potential rarity of the habitat. Potentially rare habitat includes the forests on Allandale's Lake Algonquin shoreline bluffs. These forests are experiencing declines in the area due to development pressures. For example, housing subdivisions are proceeding on the southfacing bluffs north of Allandale. Most of the prominent Lake Algonquin bluffs are situated around the rapidly-expanding Town of Barrie.

Finally, the significant areas were assessed for their overall significance. All sites were considered to be significant because they represent the largest and most vegetatively-diverse example of postglacial Lake Algonquin erosional bluffs in the Simcoe Uplands/ Lowlands Physiographic Regions (Site Districts 6-6, 6-7 and 6-8).

Table 6 provides a comparison with the other ANSI's containing forested bluff features. Smaller examples are known to occur at 3 Life Science ANSIs: Fergusonvale North, Awenda Provincial Park and Giant's Tomb, and the Earth Science ANSI: Ardtrea Island. These bluffs, however, lack the diversity of vegetation communities and physical features (e.g. prominent mid-slope terraces and highly-dissected valley systems) found at the Allandale bluffs.

The significant areas of Allandale show either extreme, high or moderate constraints to development, and these were assessed in accordance with the Revised Report Format (Ontario Ministry of Natural Resources, 1976).

Table 5: **Significance of Selected Areas in the Allandale Lake Algonquin Bluffs Area of Natural and Scientific Interest** (refer Map 2)

	Representative Value	Scientific Value	Interpretive Educational Value	Significant Habitat/Features	No. of Regionally Rare Species	No. of Provincially and Nationally Rare Species	Total Rare species	Overall Significance
E1	B	B	A	B				R
E2	A	A	A	A	2	1	3	R
H1	A	A	A	A	2	1	3	R
H2	B	B	B	B	1	1	2	R
H3	B	B	B	B				R
H4	A	A	A	A	4		4	R*
H5	A	A	A	A	1		1	R
H6	C	B	B	C	1		1	R
M1	C	C	B	C	2		2	L

Legend:
- **A** very high
- **B** high
- **C** moderate
- **R** Regional
- **L** Local
- ***** The association of extensive oak forests with exceptional glacial lake bluffs may be provincially significant (refer to text, Chap. III, (i)).

Table 6: A Comparison of the Allandale Lake Algonquin Bluffs with Other Areas of Natural and Scientific Interest Supporting Forested Erosional Bluffs in the Simcoe Uplands/Lowlands Physiographic Regions (Site Districts 6-6, 6-7 and 6-8)

Location of ANSI	Physical Features	Vegetation Features
Erosional bluffs formed by the Upper Algonquin Lake stages (Main Algonquin, Ardtrea, Upper Orillia, Lower Orillia)		
1. Ardtrea Island Earth Science 31D/11 240 480	1 km of forested bluff, 6 m high	Sugar Maple Forest and pasture
2. Fergusonvale North 31D/12 935 345	3 km of forested bluff, from 23 to 46 m high - dissected by valleys with varied slope aspect/degree	Sugar Maple; Sugar Maple with Beech, White Pine, Paper Birch, Trembling Aspen (Hanna, 1984b)
3. Awenda Provincial Park 31D/13 820 650	1 km of forested bluff, 69 m high - steep north-facing slope with no terraces or associated valleys	Sugar Maple - Beech - Yellow Birch - Hemlock (Hanna, 1984b)
4. Allandale Lake Algonquin Bluffs 31D/5 010 100	7 km of forested bluff, 50 to 70 m high - highly dissected by 7 valley systems with varied slope aspect/ degree and prominent mid-slope terraces	28 community types: deciduous and mixed upland forests, deciduous, mixed conifer swamps, fields and marshes
Erosional bluffs formed by the Lower Algonquin Lake stages (Wyebridge, Penetang, Cedar Point, Payette), Lake Nipissing and Post-Lake Nipissing:		
5. Awenda Provincial 31D/13 820 650	3.5 km of forested bluff, 53 m high - see 3. above	see 3. above
6. Giant's Tomb 41A/16 780 720	46 m high forested bluff encircling a 1 km diameter dome - varied slope aspects with no terraces or associated valleys	Yellow Birch - Sugar Maple-Paper Birch, Sugar Maple - Beech - Hemlock (Hanna, 1984b)

The wetlands were identified as areas of extreme sensitivity because of their high water tables and fragile organic substrates. Disturbance within these communities could also impact on downstream habitats.

The drier forested bluffs were placed in the category of high sensitivity because the steep slopes and sandy substrates are prone to erosion. Only low-intensity uses would be appropriate in these areas, such as those which would not "require construction extensive clearing of vegetation or terrain deformation" (O.M.N.R., 1976 p. 19).

The more gradually sloping and mesic habits of community type 6d was designated an area of moderate sensitivity. This community is situated on lower slopes and the drier portions of valley bottomlands. The soils are still sandy, but the more gradual slopes minimize the risk of erosion.

E1 Open Water (community type 1) Emergent Marsh and Meadow Marsh (community type 2)

These non-forested wetlands are typical of those found on the muck soils of the Simcoe Lowlands. Much larger examples, however, can be found in the Holland River Marsh and Minesing Swamp ANSIs. They contribute to the diversity of the ANSI, being the only native non-forested communities in the study area. From an educational and interpretive viewpoint, they illustrate the wetter types of wetland systems.

E2 Swamp: Conifer Swamp (community type 3) and Mature Mixed Swamp (community type 4a)

The conifer and mixed swamps are representative of those found on the muck soils of the Simcoe Lowlands (Site Districts 6-6, 6-7 and 6-8). Within Site District 6-8, these communities are not represented in the Holland River Marsh ANSI. Similar examples, however, do occur within ANSIs of the adjacent Site District 6-6 (e.g. Minesing Swamp and Nottawasaga River) and Site District 6-7 (e.g. Pottageville Swamp). The Allandale swamps are noteworthy for their maturity, with some sections appearing to contain trees at least 100 years old. Forests of this maturity tend to be rare or absent in the other ANSIs on the Simcoe Lowlands.

The swamps harbour 2 regionally rare plant species: a Clearweed (*Pilea fontana*) and Flowering Raspberry (*Rubus odoratus*), and it is one of only two stations in the Simcoe Region for *Carex prasina*, a provincially and nationally rare sedge. These wetlands also add to the diversity of the ANSI, providing a contrast to the upland forests that occupy the majority of the study area. Finally, the swamps are an important headwater source for the Bear Creek watershed, which flows into the Nottawasaga River. Seven of the 8 streams bisecting the bluffs have their headwaters in these swamps.

H1 Mesic Upland Deciduous Forest: Rich Sugar Maple (community type 6a)

This forest type is representative of those occurring on uplands within the Simcoe Lowlands and Simcoe Uplands Physiographic Regions (Site Districts 6-6, 6-7 and 6-8). Within the Simcoe Lowlands, uplands are estimated to be forested on only 20% of Site District 6-6 (Hanna, 1984b) and 8% of Site District 6-8 (Hanna, 1984a). On the Lowlands, rich Sugar Maple forests are represented in 2 other ANSIs: the Nottawasaga River (Site District 6-6) and Pottageville Swamp (Site District 6-7 (Lindsay, 1984)), but the largest examples and some of the more mature ones are found at Allandale. Within the Simcoe Uplands Physiographic Region, rich Sugar Maple forests are also found at such ANSIs as Fergusonvale North, Rugby West and, to a lesser extent, Awenda Provincial Park.

Finally, this rich habitat sustains 2 regionally rare plant species: Woodland Poa (*Poa alsodes*) and Black Snakeroot (*Sanicula trifoliata*) - 1 of only 3 stations for this species in Simcoe, and the provincially rare and nationally threatened, American Ginseng (*Panax quinquefolium*).

H2 Mesic Upland Deciduous Forest (community types 6b and 6c)

This admixture of mature Sugar Maple forests and more successional ones is representative of those occurring on uplands within the Simcoe Lowlands and Simcoe Uplands Physiographic Regions. Similar stands occur at the following ANSIs: Pottageville Swamp, Nottawasaga River, Fergusonvale North, Rugby West, Giant's Tomb and Awenda Provincial Park. It also provides habitat for a regionally rare Sedge (*Carex platyphylla*) and the provincially rare and nationally threatened American Ginseng (*Panax quinquefolium*) (White, 1988).

H3 Dry Mesic Upland Deciduous Forest (community types 7a, 7b, 7c and 7d)

This amalgam of mature and more successional forests is typical of those occurring on uplands in the region. Its significance is comparable to the mesic deciduous forests of H2.

H4 Dry Upland Deciduous Forest (community types 8a and 8b)

This admixture of mature and more successional forests is representative of those on the Simcoe Uplands Physiographic Region. The extensive oak stands at Allandale are rarely encountered in other ANSIs within this region. Other examples are located on the Uplands at Awenda Provincial Park and the dunes of Wasaga Beach Provincial Park. Moreover, the Allandale stands are unique in the Region, containing the only sizeable oak forests on a Lake Algonquin erosional bluff feature within the ANSI system.

The largest and most mature example of Allandale oak forests is situated on the extensive mid-slope terraces and lower slopes of the bluffs (UTM GRID REF.: 31D/15 015106), just east of a large abandoned gravel pit.

These oak forests are important for scientific and interpretive reasons, especially from the viewpoint of phytogeography. For example, they sustain a large assemblage of southern species, some with prairie affinities (e.g. *Lespedeza intermedia* and *Desmodium dillenii*). In addition, Allandale oak forests are phytogeographically noteworthy for their complete absence of White Oak (*Quercus alba*) in the tree layer. Elsewhere in southern Ontario, White Oak co-dominates with Red Oak (*Quercus rubra*) on dry sites. Only at Allandale and the region to the west (e.g. lower Bruce County, Grey County, Dufferin County, Perth County and northern Huron County) do you get Red Oak as the sole dominant on dry sites.

The dry forests also provide habitat for 4 regionally rare plant species: a Bush Clover (*Lespedeza intermedia*), a Tick-trefoil (*Desmodium dillenii*), Flowering Raspberry (*Rubus odoratus*) and Stemless Blue Violet (*Viola adunca*). The first 2 species are at the northern limit of their range.

H5 Mesic Upland Mixed Forest (community types 9a and 9b)

These old-growth mixed forests are representative of upland forests on colder-than-normal sites in the Simcoe Lowlands and Simcoe Uplands Physiographic Regions. Similar examples occur in the following ANSIs: Nottawasaga River, Awenda Provincial Park and Minesing Swamp. The Allandale stands, however, are noteworthy for their maturity and relatively large acreage.

From a scientific viewpoint, these stands are of high value. The wide range of habitats occupied by Hemlock (*Tsuga canadensis*) in Allandale provides an excellent opportunity to study the ecology of this important tree species. These mixed forests also add to the diversity of upland forest types in the study area.

The communities support the regionally rare Sedge, *Carex platyphylla*.

H6 Dry Mesic Upland Mixed Forest (community types 10a, 10b and 10c)

These forests are typical of those encountered on uplands elsewhere in the Simcoe Lowlands/Uplands Physiographic Regions Most of the region's ANSIs support similar stands. The dry mesic mixed forests in combination with the mesic ones of H5, however, do add to the diversity of Allandale, where most upland forests are deciduous. They also support the regionally rare Flowering Raspberry (*Rubus odoratus*).

M1 Mesic Upland Deciduous Forest: Successional Large-toothed Aspen - Red Maple-Sugar Maple (community type 6f)

This community forms narrow linear stands on the lower slopes and valley bottomlands. Most stands are successional, with some having colonized former logging roads and depots. They are typical of successional stands on mesic sites in the Simcoe Lowlands/Uplands Physiographic Regions.

The community has been included in the significant designation because its branching stands are intimately tied in with more mature conifer swamps elsewhere on the bottomlands and the older upland forests on surrounding valley slopes. Moreover, it adds to the diversity of Allandale, sustaining the only extensive forests where Red Maple (*Acer rubrum*) is a major tree species.

This area is also important from an interpretive viewpoint. Most of the existing foot trails are situated on the gradual slopes of this community. These ready-made trails would be ideal for interpretive purposes.

(ii) PRELIMINARY ENVIRONMENTAL ANALYSIS

Allandale and the surrounding region are intimately tied together from a hydrological perspective. The wetland communities at Allandale consist of 8 watersheds, which are headwaters of Bear Creek. Alteration of the water levels in any of them may impact on wetlands downstream and, perhaps, on the extensive lowland swamps below the study area.

Most of Allandale's wetlands are dependent on water seeping from underground aquifers along the base of the lower and upper bluffs. Development on these slopes or alteration of the contours could have impacts on these springs and on the wetlands. The water in these aquifers originates from precipitation falling on the till plain of the Innisfil Uplands south of the bluffs, where development is currently minimal.

Within Allandale, the areas considered significant (Map 3) were assessed as having extensive (E), high (H), or moderate (M) constraints to development. The criteria used to assign such rankings have been outlined in the previous section.

The non-forested wetlands (E1) and the swamps (E2) were considered to have extreme constraints to development. These wetlands cannot sustain intensive use or development because of their easily-compacted organic soils and the high moisture regimes (ranging from open water to wet mesic conditions). Construction or excavation, particularly on the seepage slopes may result in slope failure.

The upland forested bluffs (H1, H2, H3, H4 and H5) are considered to be areas of high environmental constraints. The communities are situated on steep sandy slopes, which are easily erodible.

Only the upland forest community (M1) was considered to be an area of moderate environmental constraints. The community is located on the lower slopes and the drier portions of the valley bottomlands. The soils are still sandy, but the slopes in this habitat are gradual to moderate.

Three wetland areas (E3), not considered significant, were assigned as having extreme constraints to development. They include 5 deciduous swamp stands (community types 5c and a portion of 5b near the southwest corner of the study area), and a mixed swamp (community type 4b) in the northwest corner of the ANSI. These wetlands were considered areas sensitive to development because they serve as connectors between significant wetland areas. In the case of community type 5b, it is also a headwater source for one of the watersheds in Allandale.

(iii) MANAGEMENT CONSIDERATIONS

1. Development proposals which could affect water quality and/or drainage patterns should be discouraged. The plant communities of the study area are hydrologically related, and disruption of the integrity of one may affect another. The Allandale bluffs are a major headwater source for Bear Creek, which flows into the Nottawasaga River (7 tributaries of Bear Creek have their headwaters in the study area). The Algonquin Bluffs may be hydrologically associated with the large aquifer situated under the floor of the valley west of Barrie. Detailed hydrological studies should be carried out before any development is allowed to proceed in the study area or adjacent lands (e.g. the exclusion areas within the ANSI, and the till plain south of the ANSI).

2. This area was initially chosen to represent the Lake Algonquin, glacial shoreline bluffs of Site District 6-8, and this inventory confirms the validity of that selection. In addition, the ANSI has also been found to support 14 rare plant species. Management of the site should retain these features.

3. Large parts of Allandale have been heavily logged over the past 50 years, and are now beginning to recover. The remaining mature stands could serve as benchmarks for scientists studying forest ecology (refer to vegetation communities in Map 1). Allandale provides an excellent opportunity for research into the relationship of vegetation to such physical parameters as slope aspect, slope degree, microclimate and soil moisture. The mature stands also serve as an important seed source for the surrounding successional forests.

4. Landowners considering construction of new homes should be encouraged to build outside the ANSI or, if not feasible, locating on non-significant areas, away from rare species.

5. Landowners of 3 fields within the study area should be encouraged to retain them in a natural, successional state (UTM GRID REFERENCES: 31D/5 014097, 014094, 994094). These fields sustain a noteworthy assemblage of rare prairie plants. Conifer plantations should be discouraged on these sites.

6. Landowners of the small conifer plantations within the Area of Natural and Scientific Interest should be encouraged to allow them to revert to native forest.

7. The owner of the active quarry abutting the northwest portion of the ANSI should be encouraged to quarry away from the ANSI, particularly the south side which contains a permanent stream. The gravel pit's site plan stipulates that extraction cannot occur closer than 30 m from the creek.

8. A detailed inventory of the fauna of the ANSI was not undertaken during this study, and such a survey is recommended.

9. Populations of rare plants should be monitored over time to determine status. This is particularly appropriate for American Ginseng (*Panax quinquefolium*), a provincially/nationally rare plant, which is threatened by ginseng collectors (White, 1988). The late season of the fieldwork precluded a complete mapping of the following rare species: *Desmodium dillenii* and *Carex prasina*. Additional surveys should be carried out for these 2 species.

10. The site should be inspected periodically to assess changes in vegetation, use of the site and level of disturbance.

REFERENCES

Argus, G.W. and D.J. White, 1984. *Panax quinquefolium* L. 1 page in G.W. Argus and C.J. Keddy, eds. Atlas of the rare vascular plants of Ontario. Part 3. National Museum of Natural Sciences, Ottawa.

Argus, G.W., K.M. Pryer, D.J. White, and C.J. Keddy, eds, 1982-1987. Atlas of the rare vascular plants of Ontario. Four parts. National Museum of Natural Sciences, Ottawa. (looseleaf).

Argus, G.W. and K.M. Pryer, 1986. Preliminary list of the rare vascular plants of Canada. Botany Division, National Museum of Natural Sciences, Ottawa. 45 pp.

Ball, P.W. and D.J. White, 1982. *Carex prasina* Wahlenb. 1 page in G.W. Argus and D.J. White, eds. Atlas of the rare vascular plants of Ontario. Part 1. National Museum of Natural Sciences, Ottawa.

Brown, D.M., G.A. McKay and L.J. Chapman, 1974. The climate of southern Ontario. 2nd ed. Environment Canada. Atmospheric Environment Branch. 50 pp.

Cadman, M.D., P.F.J. Eagles and F.M. Helleiner, 1987. Atlas of the breeding birds of Ontario. Federation of Ontario Naturalists and the Long Point Bird Observatory. University of Waterloo Press. 617 pp.

Chapman, L.J. and P.F. Putnam, 1984. The physiography of southern Ontario. 3rd ed. Ontario Geological Survey, Special Volume 2. 270 pp. Accompanied by Map P.2715, scale 1:600,000.

Curtis, J.T., 1959. The vegetation of Wisconsin. University of Wisconsin Press, Madison. 657 pp.

Gould, J., 1986. A biological inventory and evaluation of the Holland Landing Prairie Relict. Parks and Recreational Areas Section, Ontario Ministry of Natural Resources, Central Region, Richmond Hill, Ontario. 40 pp. + 2 maps.

Hanna, R., 1984a. Life Science Areas of Natural and Scientific Interest in Site district 6-8: a review and assessment of significant natural areas in Site District 6-8. Parks and Recreational Areas Section, Ontario Ministry of Natural Resources, Central Region, Richmond Hill, Ontario. 71 pp. + folded map.

Hanna, R., 1984b. Life Science Areas of Natural and Scientific Interest in Site District 6-6: a review and assessment of significant natural areas in Site District 6-6. Parks and Recreational Areas Section, Ontario Ministry of Natural Resources, Central Region, Richmond Hill, Ontario. 81 pp. + map.

Hills, G.A., 1959. A ready reference to the description of land of Ontario and its productivity. Maple Division of Research, Ontario Department of Lands and Forests.

Lindsay, K.M., 1984. Life Science Areas of Natural and Scientific Interest in Site District 6-7: a review and assessment of significant natural areas in Site District 6-7. Parks and Recreational Areas Section, Ontario Ministry of Natural Resources, Central Region, Richmond Hill, Ontario. 77 pp. + map.

Looman, J. and K.F. Best, 1979. Budd's flora of the Canadian Prairie Provinces. Research Branch, Agriculture Canada, Publication 1662. 863 pp.

Marquis, R.J. and E.G. Voss, 1981. Distributions of some western North American plants disjunct in the Great Lakes region. The Michigan Botanist 20:53-82.

Maycock, P.F., 1979. A preliminary survey of the vegetation of Ontario with special reference to the establishment of nature reserves (Draft). Parks and Recreational Areas Branch, Division of Parks, Ontario Ministry of Natural Resources. (unpublished photostat, unpaginated).

Ontario Ministry of Natural Resources, 1976. Revised report format. Environmental Planning Series. Park Planning Branch, Division of Parks. 44 pp.

Ontario Ministry of Natural Resources, 1983. Huronia District land use guidelines. 52 pp. + map.

Pryer, K.M. and D.M. Britton, 1987. *Botrychium rugulosum*. W.H. Wagner. 2 pages in Pryer, K.M. & G.W. Argus, eds. Atlas of the rare vascular plants of Ontario. Part 4. National Museum of Natural Sciences, Ottawa.

Reznicek, A.A., 1983. Association of relict prairie flora with Indian trails in central Ontario. Proceedings of the Eighth North American Prairie Conference: 33-39.

Reznicek, A.A., 1986, in prep. Vascular plants of Simcoe County. (MS., Central Region, Ontario Ministry of Natural Resources). 41 pp.

Reznicek, A.A., 1987. Simcoe County rare plants. (MS., Central Region, Ontario Ministry of Natural Resources). 12 pp.

Reznicek, A.A. pers. comm. Telephone conversations Nov. 4,7 in 1988 and letters Jan. 12 and Nov., 1988. University of Michigan Herbarium, North University Building, Ann Arbor, Michigan.

Riley, J.L., 1988. Distribution and status of the vascular plants of Central Region. Ontario Ministry of Natural Resources, Parks and Recreational Areas Section, Central Region, Richmond Hill. (unpublished) 97 pp.

Rowe, J.S., 1972. Forest regions of Canada. Department of Fisheries and the Environment. Canadian Forestry Service, Publication No. 1300. 172 pp. + map.

Scoggan, H.J., 1978-1979. The flora of Canada, 4 vols. National Museum of Natural Sciences. 1171 pp.

White, D.J., 1988. Ecological study and status report on American Ginseng (*Panax quinquefolium*) a threatened species in Canada. The Subcommittee for Plants, Committee on the Status of Endangered Wildlife in Canada (COSEWIC). 165 pp.

MAP REFERENCES

National Topographic Series (NTS), 1978. Map Sheet 31D/5, Barrie. Edition 5, Scale 1:50,000. Surveys and Mapping Branch, Canada, Department of Energy, Mines and Resources.

Ontario Ministry of Natural Resources, 1978. Aerial Photography, Nominal Scale 1:10,000. Flight Line 4422, Roll 10, Frames 107-109; Flight Line 4423, Roll 10, Frames 21-28; Flight Line 4424, Roll 52, Frames 322-328; Flight Line 4425, Roll 10, Frames 66-70. Surveys and Mapping Branch, Ministry of Natural Resources.

Ontario Ministry of Natural Resources, 1984. Ontario Basic Map (OBM), Sheets 10 17-6000-49050, 10 17-6000-49100, 10 17-5950-49050, 10 17-5950-49100. Surveys and Mapping Branch, Ministry of Natural Resources.

APPENDIX A: VASCULAR PLANTS OF THE ALLANDALE LAKE ALGONQUIN BLUFFS AREA OF NATURAL AND SCIENTIFIC INTEREST

A total of 449 species (450 taxa) have been recorded in the study area with an additional 34 species in the vicinity. The 363 native species constitute 19.1% of Ontario's native flora (Scoggan 1978-79). Eighty-six species or 19.3% of the Allandale flora have been introduced.

The 81 introduced species are denoted by the symbol "+" along the left margin and the 5 species with a doubtful origin by the symbol "(+)".

The botanical names were derived from checklists for Simcoe County (Reznicek, 1986) and the Ministry of Natural Resources, Central Region (Riley, 1988).

Taxa confirmed by voucher specimens are denoted by the following acronyms for the herbarium repository: Royal Ontario Museum (TRT) and University of Michigan (MICH). Voucher specimens and sight records are based on the following sources:

AAR - Dr. A.A. Reznicek, **RB** - Rick Bobbette, **SV** - Steve Varga, **JEH** - J.E. Hanna

Species	Common Name	Community Number	Source
LYCOPODIACEAE	**CLUBMOSS FAMILY**		
Lycopodium annotinum L.	Stiff Clubmoss	8	SV
Lycopodium clavatum L. var. *clavatum*	Running Clubmoss	10	SV
Lycopodium dendroideum Michx. (*L. obscurum* L. var. *dendroideum* (Michx.) D.C. Eat. *ex* A. Gray)	Round-branched Ground-pine	6	SV (TRT)
Lycopodium digitatum Br. (*L. complanatum* L. var. *flabelliforme* Fern.)	Crowfoot Clubmoss	6,8,9, 10,11,12	SV
Lycopodium lucidulum Michx.	Shining Clubmoss	3,4,5	SV
Lycopodium obscurum L. var. *isophyllum* Hickey	Ground-pine	6,9	SV (TRT)
Lycopodium tristachyum Pursh	Ground-cedar	12	SV (TRT)
EQUISETACEAE	**HORSETAIL FAMILY**		
Equisetum arvense L.	Field Horsetail	2,3,4,5	SV, AAR
Equisetum hyemale L. var. *affine* (Engelm.) A.A. Eat.	Scouring-rush	2,5	SV
Equisetum scirpoides Michx.	Dwarf Scouring-rush	3,4,6	SV

EQUISETACEAE (Cont'd)	**HORSETAIL FAMILY**		
Equisetum sylvaticum L.	Woodland Horsetail	2	SV
Equisetum variegatum Schleich.	Variegated Scouring-rush	12,13	SV
OPHIOGLOSSACEAE	**ADDER'S-TONGUE FAMILY**		
Botrychium dissectum Spreng. f. *dissectum* (B. *dissectum* Spreng. var. *dissectum*)	Dissected Grape Fern	10,11	SV (TRT)
f. *obliquum* (B. *dissectum* Spreng. var. *obliquum* (Muhl.) Clute)	Oblique Grape Fern		
Botrychium multifidum (Gmel.) Rupr.	Leather-leaved Grape Fern	7,8,12	SV
Botrychium rugulosm W.H. Wagner (*B. multifidum* (Gmel.) Rupr. f. *dentatum* R. Tryon, *B. ternatum* auctt. non (Thunb.) Sw.)	Rugulose Grapefern	12	RB (MICH)
Botrychium virginianum (L.) Sw.	Rattlesnake Fern	3,4,5,6,7	SV
OSMUNDACEAE	**ROYAL FERN FAMILY**		
Osmunda cinnamomea L.	Cinnamon Fern	3,4,5	SV
Osmunda regalis L. var. *spectabilis* (Willd.) Gray	American Royal Fern	3,4,5	SV
DENNSTAEDTIACEAE	**BRACKEN FAMILY**		
Dennstaedtia punctilobula (Michx.) Moore	Hay-scented Fern	6	SV
Pteridium aquilinum (L.) Kuhn var. *latiusculum* (Desv.) Underw.	Eastern Bracken	3,4,5,6,7 9,10,11,12	SV
ADIANTACEAE	**MAIDENHAIR FERN FAMILY**		
Adiantum pedatum L.	Northern Maidenhair Fern	3,4,6	SV

ASPLENIACEAE	SPLEENWORT FAMILY		
Athyrium filix-femina (L.) Roth var. *michauxii* (Spreng.) Fern. (A. *angustum* (Willd.) Presl. var. *angustum*)	Northeastern Lady Fern	3,4,5,6,9	SV
Athyrium thelypterioides (Michx.) Desv.	Silvery Glade Fern	6	AAR (MICH)
Cystopteris bulbifera (L.) Bernh.	Bulblet Fern	3,4	SV
Dryopteris carthusiana (Vill.) H.P. Fuchs (*D. spinulosa* (O.F. Muell.) Watt)	Spinulose Wood Fern	2,3,4,5,6	SV
Dryopteris clintoniana (D.C. Eat.) Dowell (*D. cristata* (L.) Gray var. *clintoniana* (D.C. Eat.) Underw.)	Clinton's Wood Fern	3,4,5	SV
Dryopteris cristata (L.) Gray	Crested Wood Fern	2,3,4,5	SV
Dryopteris intermedia (Willd.) Gray (*D. spinulosa* (O.F. Muell.) Watt. var. *intermedia* (Willd.) Underw.)	Glandular Wood Fern	2,3,4,5,6, 7,9,10	SV
Dryopteris marginalis (L.) Gray	Marginal Wood Fern	3,4,6,7,9,10	SV
Dryoperis X *triploidea* Wherry (*D. spinulosa* (O.F. Muell.) Watt. var. *fructuosa* (Gilb.) Trud.	(*D. intermedia* X *D. carthusiana*)	3,4,9	SV
Gymnocarpium dryopteris (L.) Newm.	Oak Fern	3,4	SV
Matteuccia struthiopteris (L.) Todaro var. *pensylvanica* (Willd.) Mort.	American Ostrich Fern	2,3,4,5	SV
Onoclea sensibilis L.	Sensitive Fern	2,3,4,5,6	SV
Polystichum acrostichoides (Michx.) Schott	Christmas Fern	3,4,6	SV

	THELYPTERIDACEAE	**BEECH FERN FAMILY**		
	Thelypteris noveboracensis (L.) Nieuw.	New York Fern	9	SV
	Thelypteris palustris (Salisb.) Schott var. *pubescens* (Lawson) Fern.	Marsh Fern	2,3,4	SV
	TAXACEAE	**YEW FAMILY**		
	Taxus canadensis Marsh.	American Yew	3,4,6,9,10	SV
	PINACEAE	**PINE FAMILY**		
	Abies balsamea (L.) Mill.	Balsam Fir	2,3,4,5,6,7 8,9,10,11,12	SV
+	*Larix decidua* Mill.	European Larch	11	SV
	Larix laricina (Du Roi) K. Koch	Tamarack	2	SV
	Picea glauca (Moench) Voss	White Spruce	3,4,8,9,10	SV
+	*Pinus banksiana* Lam.	Jack Pine	11,12	SV
	Pinus resinosa Ait.	Red Pine	8,11	SV
	Pinus strobus L.	White Pine	2,3,4,5,6,7 8,9,10,11,12	SV
+	*Pinus sylvestris* L.	Scotch Pine	11	SV
	Tsuga canadensis (L.) Carr.	Eastern Hemlock	2,3,4,5,6, 7,8,9,10	SV
	CUPRESSACEAE	**CYPRESS FAMILY**		
	Juniperus communis L. var. *depressa* Pursh	Common Juniper	8,12	SV
	Juniperus virginiana L.	Red Cedar	12	SV
	Thuja occidentalis L.	White Cedar	2,3,4,5,6, 7,8,9,10	SV
	TYPHACEAE	**CATTAIL FAMILY**		
	Typha latifolia L.	Common Cattail	2	SV
	ALISMATACEAE	**WATER-PLAINTAIN FAMILY**		
	Alisma plantago-aquatica L.	Water-plaintain	2,5	SV

	POACEAE	GRASS FAMILY		
+	*Agropyron pectiniforme* R. & S.	Crested Wheat Grass	12	AAR (MICH)
+	*Agropyron repens* (L.) Beauv.	Quack Grass	12	SV
+	*Agrostis gigantea* Roth.	Redtop	2,12	SV
	Brachyelytrum erectum (Roth.) Beauv.	Bearded Shorthusk	3,4,9	SV
+	*Bromus inermis* Leyss.	Smooth Brome Grass	12	SV
	Calamagrostis canadensis (Michx.) Beauv.	Canada Blue-joint	2	SV
	Cinna latifolia (Goepp.) Griseb.	Nodding Wood Grass	3,4,5	SV
+	*Dactylis glomerata* L.	Orchard Grass	12	SV
	Danthonia spicata (L.) R. & S.	Poverty Oat Grass	8,12	SV
	Elymus hystrix L.	Bottle-brush Grass	5,6,7,8	SV
	Elymus virginicus L.	Virginia Wild-rye	2,3,4	SV
	Festuca obtusa Biehl.	Nodding Fescue	6	SV
	Glyceria grandis S. Wats.	Tall Manna Grass	2	SV
	Glyceria striata (Lam.) A.S. Hitchc.	Fowl Manna Grass	2,3,4,5	SV
	Leersia oryzoides (L.) Sw.	Cut Grass	2,3,4	SV
	Milium effusum L.	Wood Millet	6	SV
	Muhlenbergia mexicana (L.) Trin.	Muhly Grass	2,3,4,8	SV (TRT)
	Oryzopsis asperifolia Michx.	Rough-leaved Mountain-rice	3,4,5,6, 7,8,9,10	SV
	Oryzopsis racemosa (Sm.) Hitchc.	Mountain-rice	6,7,8	SV
	Panicum capillare L.	Witch Grass	12	SV
	Panicum lanuginosum Ell. var. *implicatum* (Scribn.) Fern (P. *implicatum* Scribn.)	Panic Grass	6,12	SV (TRT)
+	*Panicum latifolium* L.	Broadleaf Panic Grass	8	SV (TRT)

	POACEAE (Cont'd)	**GRASS FAMILY**		
+	*Panicum linearifolium* Britt.	Narrow-leaved Panic Grass	12	SV (TRT)
	Panicum xanthophysum A. Gray	Panic Grass	8	SV (TRT)
	Phalaris arundinacea L.	Reed Canary Grass	2,3,4	SV
	Phleum pratense L.	Timothy	12	SV
	Poa alsodes L.	Woodland Poe	6	SV
(+)	*Poa compressa* L.	Canada Blue Grass	8,12	SV
+	*Poa nemoralis* L.	Wood Blue Grass	7	SV (TRT)
	Poa palustris L.	Fowl Manna Grass	2,3,4	SV
+	*Poa pratensis* L.	Kentucky Blue Grass	12	SV
	Schizachne purpurascens (Torr.) Sw.	False Melic Grass	6,7,8,9	SV
+	*Setaria glauca* (L.) Beauv.	Yellow Foxtail	12	SV
	Sphenopholis intermedia (Rydb.) Rydb.	Slender Wedge Grass	3,4	SV (TRT)
	Sporobolus cryptandrus (Torr.) Gray	Sand Dropseed	12	SV
	Sporobolus neglectus Nash	Overlooked Dropseed	12	SV (TRT)
	CYPERACEAE	**SEDGE FAMILY**		
	Carex albursina Sheld.	Sedge	6	SV
	Carex arctata Boott	Sedge	3,4,6,7,8,9	SV
	Carex bebbii (Bailey) Fern.	Sedge	2,3,4	SV (TRT)
	Carex brevior (Dewey) Mack.	Sedge	12	SV (TRT)
	Carex communis Bailey	Sedge	9	SV
	Carex convoluta Mack. (incl. in *C. rosea* Schk. *ex* Willd.)	Sedge	6,7,8,12	SV
	Carex deweyana Schw.	Sedge	3,4,6,7	SV
	Carex disperma Dew.	Sedge	2,3,4	SV
	Carex flava L.	Sedge	2,3,4	SV (TRT)
	Carex foenea Willd.	Sedge	12	SV (TRT)

CYPERACEAE (Cont'd)	SEDGE FAMILY		
Carex gracillima Schw.	Sedge	3,4,5,6,9,12	SV
Carex granularis Muhl. *ex* Willd.	Sedge	12	SV
Carex hitchcockiana Dew.	Sedge	6	SV (TRT)
Carex hystericina Muhl. *ex* Willd.	Sedge	2	SV (TRT)
Carex interior Bailey	Sedge	2,3,4	SV (TRT)
Carex intumescens Rudge	Sedge	3,4,5,6,9	SV
Carex laevivaginata (Kukenth.) Mack.	Sedge	2,3,4	SV (TRT)
Carex laxiflora Lam.	Sedge	8	SV (TRT)
Carex leptalea Wahl.	Sedge	2,3,4	SV
Carex leptonervia Fern.	Sedge	6	SV (TRT)
Carex muhlenbergii Schk. *ex* Willd.	Sedge	12	SV (TRT)
Carex peckii Howe	Sedge	6,7,9	SV (TRT)
Carex pedunculata Muhl. *ex* Willd.	Sedge	3,4,5,6,7, 8,9,10	SV
Carex pensylvanica Lam.	Sedge	8	SV
Carex plantaginea Lam.	Sedge	3,4,6	SV
Carex platyphylla Carey	Sedge	8,9	SV
Carex prasina Wahl.	Drooping Sedge	3,4	SV (TRT)
Carex retrorsa Schw.	Sedge	2	SV (TRT)
Carex rosea Schk. *ex* Willd.	Sedge	3,4,5	SV
Carex rugosperma Mack.	Sedge	12	SV
Carex scabrata Schw.	Sedge	2,3,4	SV
Carex schweinitzii Schw.	Sedge	3,4	SV (TRT)
Carex stipata Muhl. *ex* Willd.	Sedge	2,3,4	SV
Carex stricta Lam.	Sedge	2	SV
Carex vulpinoidea Michx.	Sedge	2,3,4	SV (TRT)

	CYPERACEAE (Cont'd)	**SEDGE FAMILY**		
	Eleocharis erythropoda Steud.	Spike-rush	2	SV
	Scirpus atrovirens Willd.	Black Bulrush	2,3,4	SV (TRT)
	Scirpus cyperinus (L.) Kunth var. *cyperinus*	Wool-grass	2,5	SV
	Scirpus validus Vahl	Softstem Bulrush	2	SV (TRT)
	ARACEAE	**ARUM FAMILY**		
	Arisaema triphyllum (L.) Schott	Jack-in-the-pulpit	3,4,5,6,9	SV
	LEMNACEAE	**DUCKWEED FAMILY**		
	Lemna minor L.	Common Duckweed	2	SV
	JUNCACEAE	**RUSH FAMILY**		
	Juncus articulatus L.	Rush	2	SV (TRT)
	Juncus dudleyi Wieg.	Rush	2	SV
	Juncus effusus L.	Rush	2	SV
	Juncus tenuis Willd.	Path Rush		SV
	LILIACEAE	**LILY FAMILY**		
	Allium tricoccum Ait.	Wild Leek	6	SV
+	*Asparagus officinalis* L.	Garden Asparagus	8,12	SV
	Clintonia borealis (Ait.) Raf.	Bluebead-lily	3,4,5,9	SV
+	*Convallaria majalis* L.	Lily-of-the-valley	12	SV
	Erythronium americanum Ker	Yellow Trout Lily	6,7,9	SV
	Lilium michiganense Farw. (*L. canadense* L. var. *umbelliferum* (Farw.) Bolvin)	Canada Lily	3,4	SV
	Maianthemum canadense Desf.	Wild Lily-of-the-Valley	3,4,5,6,7, 8,9,10,11	SV
	Medeola virginiana L.	Indian Cucumber-root	3,4,7,9	SV
	Polygonatum pubescens (Willd.) Pursh	Solomon's-seal	6,7,8,9,10	SV
	Smilacina racemosa (L.) Desf.	False Solomon's-seal	3,4,5,6,7	SV

LILIACEAE (Cont'd)	**LILY FAMILY**		
Smilacina stellata (L.) Desf.	False Solomon's-seal	8,9	SV
Smilax herbacea L.	Carrion-flower	3,4,5,6,7, 8,10,12	SV
Smilax hispida Torr. (*S. tamnoides* L. var. *hispida* (Torr.) Fern.)	Bristly Greenbrier	8	SV
Streptopus roseus Michx.	Twisted Stalk	9	SV
Trillium erectum L.	Purple Trillium	9	SV
Trillium grandiflorum (Michx.) Salisb.	Common Trillium	6,7,9	SV
Uvularia grandiflora Sm.	Bellwort	6,7,8	SV
IRIDACEAE	**IRIS FAMILY**		
+ *Iris germanica* L.	Flag	2	AAR (MICH)
ORCHIDACEAE	**ORCHID FAMILY**		
Corallorhiza maculata (Raf.) Raf.	Spotted Coral-root	6	SV
Corallorhiza striata Lindl.	Striped Coral-root	6	SV
+ *Epipactis helleborine* (L.) Crantz	Helleborine	2,3,4,5,6, 7,8,9,10,11	SV
Galearis spectabilis (L.) Raf. (*Orchis spectabilis* L.)	Showy Orchis	6	SV
Platanthera hyperborea (L.) Lindley (*Habenaria hyperborea* (L.) R.Br.	Northern Green Orchid	2,3,4	SV (TRT)
SALICACEAE	**WILLOW FAMILY**		
Populus balsamifera L.	Balsam Poplar	3,4,5,12	SV
Populus grandidentata Michx.	Large-toothed Aspen	5,6,7,8, 9,10,11,12	SV
Populus tremuloides Michx.	Trembling Aspen	3,4,5,8, 10,11,12	SV
Salix amygdaloides Anderss.	Peach-leaved Willow	2,3,4,5	SV
Salix bebbiana Sarg.	Beaked Willow	2	SV (TRT)

SALICACEAE (Cont'd)	**WILLOW FAMILY**		
+ *Salex discolor* Muhl.	Pussy Willow	2	SV
Salix eriocephala Michx. (*S. rigida* Muhl.)	Heart-leaved Willow	2,3,4	SV (TRT)
Salix fragilis L.	Crack Willow	2	SV
Salix lucida Muhl.	Shining Willow	2	SV
Salix petiolaris Sm.	Slender Willow	2,3,4	SV
JUGLANDACEAE	**WALNUT FAMILY**		
Juglans cinerea L.	Butternut	3,4,5,6	SV
BETULACEAE	**BIRCH FAMILY**		
Betula alleghaniensis Britt. (*B. lutea auct., non* Michx.)	Yellow Birch	2,3,4,5, 6,9,10	SV
Betula papyrifera Marsh.	White Birch	2,3,4,5,6,7 8,9,10,11,12	SV
Ostrya virginiana (Mill.) K. Koch	Ironwood	5,6,7, 8,9,10	SV
FAGACECAE	**BEECH FAMILY**		
Fagus grandifolia Ehrh.	Beech	6,7,8,9,10	SV
Quercus rubra L.	Red Oak	3,4,5,6,7, 8,9,10,11,12	SV
ULMACEAE	**ELM FAMILY**		
Ulmus americana L.	White Elm	2,3,4,5,6,12	SV
Ulmus rubra Muhl.	Red Elm	6	SV (TRT)
URTICACEAE	**NETTLE FAMILY**		
Laportea canadensis (L.) Wedd.	Wood Nettle	3,4	SV
Pilea fontana (Lunell) Rydb.	Clearweed	2	SV (TRT)
Urtica dioica L. ssp. *gracilis* (Ait.) Seland. (*U. procera* Muhl.)	American Stinging Nettle	2,3,4	SV
ARISTOLOCHIACEAE	**BIRTHWORT FAMILY**		
Asarum canadense L.	Wild Ginger	3,4,5,6,9,10	SV

	POLYGONACEAE	**BUCKWHEAT FAMILY**		
	Polygonum douglassii Greene	Knotweed	12	SV
(+)	*Polygonum hydropiper* L.	Marshpepper Smartweed	2,3,4	SV (TRT)
	Polygonum persicaria L.	Lady's Thumb	2,3,4	SV (TRT)
+	*Rumex acetosella* L.	Sheep Sorrel	12	SV
+	*Rumex obtusifolius* L.	Bitter Dock	3,4	SV (TRT)
	Rumex orbiculatus Gray	Great Water Dock	2,3	SV (TRT)
	CHENOPODIACEAE	**SPINACH FAMILY**		
+	*Chenopodium album* L.	Lamb's-quarters	13	SV (TRT)
+	*Kochia scoparia* (L.) Schrad.	Summer Cypress	13	SV
	PORTULACACEAE	**PURSLANE FAMILY**		
	Claytonia caroliniana Michx.	Spring Beauty	6	SV
	CARYOPHYLLACEAE	**PINK FAMILY**		
+	*Arenaria serpyllifolia* L.	Thyme-leaved Sandwort	12	SV (TRT)
+	*Cerastium fontanum* Baumg. (ssp. *triviale* (Link) Jatas)	Mouse-eared Chickweed	12	SV (TRT)
+	*Dianthus armeria* L.	Deptford Pink	12	SV (TRT)
+	*Saponaria officinalis* L.	Bouncing-bet	12	SV
+	*Silene pratensis* (Rafn.) Godr. & Gren. (*S. alba* (Mill.) E.H.L. Krause)	White Cockle	12	SV (TRT)
+	*Silene vulgaris* (Moench) Garcke (*S. cucubalus* Wibel)	Bladder Campion	12	SV
	RANUNCULACEAE	**CROWFOOT FAMILY**		
	Actaea pachypoda Ell. (*A. alba sensu* Bibel.)	White Baneberry	3,4,6,7,9	SV
	Actaea rubra (Ait.) Willd.	Red Baneberry	5	SV
	Anemone canadensis L.	Canada Anemone	2,3,4	SV
	Anemone cylindrica Gray	Long-fruited Anemone	8,12	SV
	Anemone virginiana (incl. *A. riparia* Fern.)	Thimbleweed	3,4,5,6,12	SV

	RANUNCULACEAE (Cont'd)	**CROWFOOT FAMILY**		
	Aquilegia canadensis L.	Wild Columbine	6,8	SV
	Caltha palustris L.	Marsh-marigold	2,3,4	SV
	Clematis virginiana L.	Virgin's-bower	2,3,4,5	SV
	Coptis trifolia (L.) Salisb. (*C. groenlandica* (Oeder) Fern.)	Gold-thread	3,4	SV
	Hepatica acutiloba DC. Fern.	Sharp-lobed Hepatica	6,7,9	SV
	Hepatica americana (DC.) Ker	Round-lobed Hepatica	7,8	SV
	Ranunculus abortivus L.	Small-flowered Buttercup	6	SV
+	*Ranunculus acris* L.	Tall Buttercup	12	SV
	Ranunculus hispidus Michx. var. *caricetorum* (Greene) T. Duncan (*R. septentrionalis* Poir.)	Swamp Buttercup	2,3,4	SV
	Ranunculus recurvatus Poir.	Hooked Buttercup	3,4,5	SV
	Ranunculus sceleratus L.	Cursed Crowfoot	2	SV (TRT)
	Thalictrum dioicum L.	Early Meadow Rue	6	SV
	BERBERIDACEAE	**BARBERRY FAMILY**		
+	*Berberis vulgaris* L.	Common Barberry	3,4	SV
	Caulophyllum thalictroides (L.) Michx.	Blue Cohosh	6,9	SV
	FUMARIACEAE	**FUMITORY FAMILY**		
	Dicentra canadensis (Goldie) Walp.	Squirrel-corn	6	SV
	BRASSICACEAE	**MUSTARD FAMILY**		
+	*Alliaria petiolata* (Bieb.) Cavara & Grande (*A. officinalis* Andrz. *ex* Bieb.)	Garlic Mustard	9	SV
	Arabis divaricarpa A. Nels.	Rock-cress	12	SV (TRT)
+	*Arabis glabra* (L.) Bernh.	Tower-mustard	12	SV
	Arabis holboellii Hornem.	Rock-cress	12	SV (TRT)
+	*Barbarea vulgaris* R. Br.	Yellow Rocket	3,4	SV

	BRASSICACEAE (Cont'd)	**MUSTARD FAMILY**		
+	*Berteroa incana* (L.) DC.	Hoary Alyssum	12	SV (TRT)
	Dentaria diphylla Michx.	Toothwort	3,4,6,9	SV
	Dentaria laciniata Muhl.	Cutleaf Toothwort	6	AAR (MICH)
+	*Hesperis matronalis* L.	Dame's-rocket	12	SV (TRT)
+	*Lepidium campestre* (L.) R. Br.	Field Pepper-grass	12	SV (TRT)
+	*Lepidium densiflorum* Schrad.	Common Pepper-grass	12	SV (TRT)
+	*Nasturtium microphyllum* (Boenn.) Reichenb.	Water Cress	2,3,4	SV
	DROSERACEAE	**SUNDEW FAMILY**		
	Drosera rotundifolia	Round-leaved Sundew	2	SV
	CRASSULACEAE	**ORPINE FAMILY**		
+	*Sedum telephium* L.	Live-forever	6	SV (TRT)
	SAXIFRAGACEAE	**SAXIFRAGE FAMILY**		
	Mitella diphylla L.	Bishop's Cap	3,4,5,6	SV
	Mitella nuda L.	Naked Mitrewort	3,4	SV
	Tiarella cordifolia L.	Foam Flower	2,3,4,5,6	SV
	GROSSULARIACEAE	**GOOSEBERRY FAMILY**		
	Ribes americanum Mill.	Wild Black Currant	3,4	SV
	Ribes cynosbati L.	Prickly Gooseberry	3,4,5,6	SV
	Ribes lacustre (Pers.) Poir.	Swamp Black Currant	3,4	SV
	Ribes triste Pall.	Swamp Red Currant	3,4,5	SV
	ROSACEAE	**ROSE FAMILY**		
	Agrimonia gryposepala Wallr.	Agrimony	3,4,5,7,12	SV
	Amelanchier laevis Wieg.	Serviceberry	8	SV (TRT)
	Crataegus apiomorpha Sarg.	Hawthorn	7	SV
+	*Crataegus monogyna* Jacq.	English Hawthorn	12	SV
	Crataegus punctata Jacq.	Dotted Hawthorn	3,4,11,12	SV
	Fragaria vesca L.	Woodland Strawberry	8,9	SV

ROSACEAE (Cont'd)	ROSE FAMILY		
Fragaria virginiana Dcne.	Strawberry	2,3,4,5, 7,8,12	SV
Geum aleppicum Jacq. var. *strictum* (Ait.) Fern.	Yellow Avens	2,3,4,5,12	SV
Geum rivale L.	Water Avens	2,3,4	SV
+ *Malus domestica* Borkh. (*Pyrus malus* L.)	Apple	12	SV
+ *Potentilla argentea* L.	Silvery Cinquefoil	12	SV
Potentilla arguta Pursh	Prairie Cinquefoil	12	SV (TRT)
(+) *Potentilla norvegica* L.	Rough Cinquefoil	3,4	SV
+ *Potentilla recta* L.	Rough-fruited Cinquefoil	8,10,12	SV
Prunus pensylvanica L. f.	Pin Cherry	6,8,10,12	SV
Prunus serotina Ehrh.	Wild Black Cherry	3,4,5,6,7, 8,9,11,12	SV
Prunus virginiana L.	Chokeberry	5,6,7,8, 10,12	SV
Rosa blanda Ait.	Wild Rose	8,12	SV
+ *Rosa eglanteria* L. (*R. rubiginosa* L.)	Sweet Brier Rose	12	SV
Rubus allegheniensis Porter	Common Blackberry	5,6,7,8,10	SV
Rubus flagellaris L. (incl. *R. arundelanus* Blanch.)	Northern Dewberry	12	SV
Rubus occidentalis L.	Black Raspberry	3,4,6,8	SV
Rubus odoratus L.	Flowering Raspberry	3,4,5	SV (TRT)
Rubus pubescens Raf.	Dwarf Raspberry	2,3,4,5	SV
Rubus strigosus Michx.) (*R. idaeus* L. var. *strigosus* (Michx.) Maxim)	Wild Red Raspberry	2,3,4,5, 7,8,12	SV
+ *Sorbus aucuparia* L. (*Pyrus aucuparia* (L.) Gaertn.)	European Mountain-ash	10	SV (TRT)

	FABACEAE (LEGUMINOSAE)	**PEA FAMILY**		
	Amphicarpaea bracteata (L.) Fern.	Hog-peanut	6	SV
	Desmodium canadense (L.) DC.	Tick-trefoil	8,12	SV (TRT)
	Desmodium dillenii Darl.	Tick-trefoil	8	SV (TRT)
	Desmodium glutinosum (Muhl.) Wood	Tick-trefoil	6,7,8	SV (TRT)
+	*Lathyrus latifolius* L.	Everlasting Pea	12	SV
	Lespedeza capitata Michx.	Round-headed Bush Clover	12	SV (TRT)
	Lespedeza intermedia (S. Wats.) Britt.	Bush Clover	8	SV (TRT)
+	*Medicago lupulina* L.	Black Medic	12	SV
	Medicago sativa L.	Alfalfa	12	SV
+	*Melilotus alba* Medic.	White Sweet-clover	12	SV
+	*Robinia pseudoacacia* L.	Black Locust	12	SV
+	*Trifolium pratense* L.	Red Clover	12	SV
+	*Trifolium repens* L.	White Clover	12	SV
+	*Vicia cracca* L.	Bird Vetch	12	SV
	GERANIACEAE	**GERANIUM FAMILY**		
+	*Geranium robertianum* L.	Herb Robert	3,4,5,6,9	SV
	OXALIDACEAE	**WOOD-SORREL FAMILY**		
	Oxalis montana Raf. (*O. acetosella* L.)	Wood-sorrel	2,3,4	SV
	POLYGALACEAE	**MILKWORT FAMILY**		
	Polygala paucifolia Willd.	Fringed Polygala	3,4,6,9,10	SV
	ANACARDIACEAE	**CASHEW FAMILY**		
	Rhus radicans L. ssp. *rydbergii* (Sm. *ex* Rydb.) McNeill (*Toxicodendron rydbergii* (Sm. *ex* Rydb.) Greene; *Rhus toxicodendron* L. var. *rydbergii* (Sm. *ex* Rydb.) Garrett)	Poison-ivy	5,6,7,8	SV

	ANACARDIACEAE (Cont'd)	**CASHEW FAMILY**		
	Rhus typhina L.	Staghorn Sumac	8,12	SV
	CELASTRACEAE	**STAFF-TREE FAMILY**		
	Celastrus scandens L.	Climbing Bittersweet	3,4,5,6,7,8	SV
	ACERACEAE	**MAPLE FAMILY**		
	Acer negundo L.	Manitoba Maple	5	SV
	Acer rubrum L.	Red Maple	2,3,4,5,6,7, 8,9,10,11,12	SV
	Acer saccharum Marsh.	Sugar Maple	2,3,4,5,6,7, 8,9,10,11,12	SV
	Acer spicatum L.	Mountain Maple	2,3,4,5,7	SV
	BALSAMINACEAE	**TOUCH ME NOT FAMILY**		
	Impatiens capensis Meerb. (*I. biflora* Walt.)	Spotted Jewelweed	2,3,4,5	SV
	RHAMNACEAE	**BUCKTHORN FAMILY**		
	Rhamnus alnifolia L'Her.	Alder-leaved Buckthorn	3,4	SV
+	*Rhamnus cathartica* L.	Common Buckthorn	12	SV
	VITACEAE	**GRAPE FAMILY**		
	Parthenocissus inserta (A. Kerner) K. Fritsch (*P. vitacea* (Knerr) Hitchc.	Virginia Creeper	6	SV
	Vitis riparia Michx.	Riverbank Grape	2	SV
	TILIACEAE	**LINDEN FAMILY**		
	Tilia americana L.	Basswood	2,3,4,5, 6,7,9,10	SV
	HYPERICACEAE	**ST. JOHN'S WORT FAMILY**		
+	*Hypericum perforatum* L.	St. John's-wort	8,12	SV
	VIOLACEAE	**VIOLET FAMILY**		
	Viola adunca Sm.	Stemless Blue Violet	8	SV
	Viola canadensis L.	Canada Violet	6,9	SV
	Viola conspersa Reich.	Dog Violet	3,4,5,6, 7,8,10	SV

VIOLACEAE (Cont'd)	**VIOLET FAMILY**		
Viola cucullata Ait.	Marsh Violet	3,4	SV
Viola incognita Brain.	White Violet	3,4,5,6,9	SV
Viola pubescens Ait. (incl. var. *pubescens* and var. *scabriuscula* T. & G.) (*V. pensylvanica* sensu auct., non Michx. var. *leiocarpa* (Fern. & Wieg.) Fern.)	Yellow Violet	6,7,8,9	SV
Viola renifolia Gray	Kidney-leaved Violet	3	SV
Viola sagittata Ait. (incl. *Viola fimbriatula* Sm.)	Arrow-leaved Violet	12	SV
Viola selkirkii Pursh	Great-spurred Violet	6,9	SV
Viola sororia Willd.	Common Blue Violet	9	SV
THYMELAEACEAE	**MEZEREUM FAMILY**		
Dirca palustris L.	Leatherwood	3,4,6	SV
ELEAGNACEAE	**OLEASTER FAMILY**		
Shepherdia canadensis (L.) Nutt.	Soapberry	10	SV
ONAGRACEAE	**EVENING-PRIMROSE FAMILY**		
Circaea lutetiana L. var. *canadensis* L. (*C. quadrisulcata* (Maxim.) Franch. & Sav.)	Enchanter's Nightshade	3,4,5,6,9,10	SV
Epilobium ciliatum Raf. (*E. glandulosum* Lehm. var. *adenocaulon* (Haussk.) Fern.; includes typical *E. glandulosum* Lehm.)	Sticky Willowherb	2,3,4,5	SV
Epilobium leptophyllum Raf.	Willowherb	2	SV (TRT)
ONAGRACEAE (Cont'd)	**EVENING-PRIMROSE FAMILY**		
Oenothera biennis L. complex (incl. *O. parviflora* L. and *O. oakesiana* (A. Gray) Robbins)	Evening-primrose	12	SV (TRT)

	ARALIACEAE	**GINSENG FAMILY**		
	Aralia nudicaulis L.	Wild Sarsaparilla	3,4,5,6, 7,8,9,10	SV
	Aralia racemosa L.	Spikenard	3,6,9	SV
	Panax quinquefolium L.	American Ginseng	6	SV (TRT)
	APIACEAE (UMBELLIFERAE)	**CARROT FAMILY**		
	Cicuta maculata L.	Spotted Water-hemlock	5	SV
	Cryptotaenia canadensis (L.) DC.	Honewort	3,4,5,6,10	SV
+	*Daucus carota* L.	Wild Carrot	12	SV
	Hydrocotyle americana L.	Marsh Pennywort	2,3,4	SV
	Osmorhiza claytonii (Michx.) Clarke	Sweet Cicely	3,4,5,6,8	SV
	Sanicula gregaria Bickn.	Black Snakeroot	3,4,5,6	SV
	Sanicula marilandica L.	Black Snakeroot	3,4	SV
	Sanicula trifoliata Bickn.	Black Snakeroot	6	SV (TRT)
	CORNACEAE	**DOGWOOD FAMILY**		
	Cornus alternifolia L.f.	Alternate-leaved Dogwood	3,4,5,6,10	SV
	Cornus canadenses L.	Bunchberry	3,4,10	SV
	Cornus rugosa Lam.	Round-leaved Dogwood	8	SV
	Cornus stolonifera Michx.	Red-osier Dogwood	2,3,4,5	SV
	PYROLACEAE	**WINTERGREEN FAMILY**		
	Chimaphila umbellata (L.) Bartr. var. *cisatlantica* Blake	Pipsissewa	8	SV
	Monotropa hypopithys L.	Pinesap	3,4	SV
	Monotropa uniflora L.	Indian-pipe	7,8,9	SV
	Orthilia secunda (L.) House (*Pyrola secunda* L.)	One-sided Pyrola	3,4	SV
	Pyrola asarifolia Michx.	Pink Pyrola	2,3,4,5	SV

PYROLACEAE (Cont'd)	**WINTERGREEN FAMILY**		
Pyrola chlorantha Sw. (*P. virens* Schweig.)	Shinleaf	3,4,8	SV (TRT)
Pyrola elliptica Nutt.	Shinleaf	3,4,5,6, 7,9,10	SV
Pyrola rotundifolia L.	Shinleaf	8	SV
ERICACEAE	**HEATH FAMILY**		
Epigaea repens L.	Trailing arbutus	3,4	SV
Gaultheria hispidula (L.) Bigel.	Creeping Snowberry	3	SV (TRT)
Gaultheria procumbens L.	Wintergreen	8,10	SV
Ledum groenlandicum Oeder	Labrador-tea	3	SV
Vaccinium angustifolium Ait.	Lowbush Blueberry	8	SV
Vaccinium myrtilloides Michx.	Velvet-leaved Blueberry	3	SV
PRIMULACEAE	**PRIMROSE FAMILY**		
Lysimachia ciliata L.	Fringed Loosestrife	3,4,5	SV
Lysimachia terrestris (L.) BSP.	Swamp Loosestrife	2	SV
Trientalis borealis Raf.	Star-flower	3,4,10	SV
OLEACEAE	**OLIVE FAMILY**		
Fraxinus americana L.	White Ash	3,4,5,6,7, 8,9,10,11,12	SV
Fraxinus nigra Marsh.	Black Ash	3,4,5	SV
Fraxinus pennsylvanica Marsh.	Green Ash	3,4,5	SV
GENTIANACEAE	**GENTIAN FAMILY**		
+ *Centaurium erythraea* Raf.	Centaury	12	SV (TRT)
APOCYNACEAE	**DOGBANE FAMILY**		
Apocynum androsaemifolium L.	Dogbane	6,8	SV
+ *Vinca minor* L.	Periwinkle	6	SV
ASCLEPIADACEAE	**MILKWEED FAMILY**		
Asclepias syriaca L.	Common Milkweed	12	SV

	CONVOLVULACEAE	**MORNING GLORY FAMILY**		
	Calystegia spithamea (L.) Pursh (*Convolvulus spithameus* L.)	Low Bindweed	8	SV
	HYDROPHYLLACEAE	**WATERLEAF FAMILY**		
	Hydrophyllum virginianum L.	Virginia Waterleaf	5,6,9	SV
	BORAGINACEAE	**BORAGE FAMILY**		
+	*Cynoglossum officinale* L.	Hound's-tongue	12	SV
+	*Echium vulgare* L.	Viper's-bugloss	12	SV
	VERBENACEAE	**VERVAIN FAMILY**		
	Verbena hastata L.	Blue Vervain	2	SV
	Verbena urticifolia L.	White Vervain	2,3,4	SV
	LAMIACEAE	**MINT FAMILY**		
	Galeopsis tetrahit L.	Hemp-nettle	3,4	SV
+	*Leonurus cardiaca* L.	Motherwort	12	SV
	Lycopus americanus Muhl.	American Water-horehound	2	SV
	Lycopus uniflorus Michx.	Water-horehound	2,3,4,5	SV
	Mentha arvensis L.	Field Mint	3,4	SV
+	*Mentha* X *piperita* L. (*pro. sp.*)	Peppermint	2	SV (TRT)
	Monarda fistulosa L.	Wild Bergamot	8,12	SV
+	*Nepeta cataria* L.	Catnip	12	SV
	Prunella vulgaris L.	Heal-all	3,4,5,6,12	SV
	Satureja vulgaris (L.) Fritsch	Wild Basil	6,8,10,12	SV
	Scutellaria lateriflora L.	Mad-dog Skullcap	2,3,4	SV
	SOLANACEAE	**NIGHTSHADE FAMILY**		
	Physalis heterophylla Nees	Clammy Ground-cherry	10	SV (TRT)
+	*Solanum dulcamara* L.	Bittersweet	2,3,4,5,6,9	SV
	SCROPHULARIACEAE	**FIGWORT FAMILY**		
	Chelone glabra L.	Turtlehead	2	SV
+	*Verbascum thapsus* L.	Common Mullein	12	SV

	SCROPHULARIACEAE (Cont'd)	**FIGWORT FAMILY**		
+	*Veronica anagallis-aquatica* L.	Water-speedwell	2	SV (TRT)
+	*Veronica officinalis* L.	Common Speedwell	3,4,5,6, 7,8,10	SV
+	*Veronica serpyllifolia* L.	Thyme-leaved Speedwell	8	SV (TRT)
	OROBANCHACEAE	**BROOM-RAPE FAMILY**		
	Conopholis americana (L.) Wallr.	Squawroot	8	SV
	Epifagus virginiana (L.) Bart.	Beech-drops	6,7,8,9	SV
	PHRYMACEAE	**LOPSEED FAMILY**		
	Phryma leptostachya L.	Lopseed	3,4,5,6,8	SV
	PLANTAGINACEAE	**PLAINTAIN FAMILY**		
+	*Plantago lanceolata* L.	English Plantain	12	SV
+	*Plantago major* L.	Broad-leaved Plantain	12	SV
	Plantago rugelii Dcne.	Rugel's Plantain	12	SV
	RUBIACEAE	**MADDER FAMILY**		
	Galium asprellum Michx.	Rough Bedstraw	2	SV
	Galium circaezans Michx.	Wild Licorice	8	SV
	Galium lanceolatum Torr.	Wild Licorice	6,7,8	SV
	Galium palustre L.	Marsh Bedstraw	2	SV (TRT)
	Galium triflorum Michx.	Sweet-scented Bedstraw	3,4,5,6, 7,8,9,10	SV
+	*Galium verum* L.	Yellow Bedstraw	12	SV (TRT)
	Houstonia longifolia Gaertn.	Bluets	8	SV (TRT)
	Mitchella repens L.	Partridge-berry	3,5,6,7,8,9	SV
	CAPRIFOLIACEAE	**HONEYSUCKLE FAMILY**		
	Diervilla lonicera Mill.	Bush-honeysuckle	6,7,8	SV
	Linnaea borealis L.	Twinflower	3,4	SV
	Lonicera canadensis Marsh.	Fly-honeysuckle	3,4,5,6,7	SV
	Lonicera dioica L.	Wild Honeysuckle	4,8,10	SV

CAPRIFOLIACEAE (Cont'd)	**HONEYSUCKLE FAMILY**		
+ *Lonicera morrowii* Gray		8	SV (TRT)
Sambucus canadensis L.	Common Elder	2,3,4,5	SV
Sambucus pubens Michx.	Red-berred Elder	3,4,5,6,9	SV
Symphoricarpos albus (L.) Blake var. *albus*	Snowberry	8	SV
Triosteum aurantiacum Bickn.	Wild Coffee	6	SV
Viburnum acerifolium L.	Maple-leaved Viburnum	6,7,8,9,10	SV
Viburnum alnifolium Marsh.	Hobblebush	9	SV
DIPSACACEAE	**TEASEL FAMILY**		
+ *Dipsacus fullonum* L. (*D. sylvestris auct.* Amer., *non* Huds.)	Teasel	12	SV
CUCURBITACEAE	**GOURD FAMILY**		
Echinocystis lobata (Michx.) T. & G.	Wild Cucumber	3,4	SV
CAMPANULACEAE	**HAREBELL FAMILY**		
Campanula uliginosa Rydb.	Marsh-bellflower	2	SV
LOBELIACEAE	**LOBELIA FAMILY**		
Lobelia inflata L.	Indian Tobacco	8,10,12	SV
Lobelia siphilitica L.	Blue Cardinal Flower	3,4	SV
ASTERACEAE (COMPOSITAE)	**ASTER FAMILY**		
Achillea millefolium L.	Yarrow	12	SV
Ambrosia artemisiifolia L.	Common Ragweed	12	SV
Anaphalis margaritacea (L.) Benth.	Pearly Everlasting	12	SV
Antennaria neglecta Greene (*A. neodioica* Greene)	Pussytoes	8,12	SV
Antennaria parlinii Fern. ssp. *fallax* (Greene) Bayer & Stebbins	Plantain-leaved Everlasting	8	SV
+ *Arctium minus* (Hill) Bernh.	Burdock	9	SV

ASTERACEAE (Cont'd) (COMPOSITAE)	ASTER FAMILY		
Artemisia campestris L. ssp. *caudata* (Michx.) Hall & Clements (*A. caudata* Michx.)	Sagewort Wormword	12	SV
Aster ciliolatus Lindl.	Aster	7,8,12	SV (TRT)
Aster cordifolius L.	Heart-leaved Aster	6,8,10	SV
Aster lanceolatus Willd. (*A. simplex* Willd.)	Tall White Aster	2	SV
Aster lateriflorus (L.) Britt.	One-sided Aster	3,4,5,6, 7,8,12	SV
Aster macrophyllus L.	Large-leaved Aster	6,7,9,10	SV
Aster novae-angliae L. (*Virgulus novae-angliae* (L.) Reveal & Keener)	New England Aster	2,12	SV
Aster puniceus L.	Red-stemmed Aster	2,3,4,5	SV
Aster sagittifolius Wedem. (*A. urophyllus* Lindl. *in* Hook.)	Arrow-leaved Aster	3,5,6,7,8,12	SV
Aster umbellatus Mill.	Flat-topped White Aster	5	SV
Bidens cernua L.	Nodding Beggarticks	2	SV
Bidens frondosa L.	Devil's Beggarticks	5	SV
+ *Centaurea maculosa* Lam.	Spotted Knapweed	12	SV (TRT)
+ *Chrysanthemum leucanthemum* L. (*Leucanthemum vulgare* Lam)	Ox-eye Daisy	2,12	SV
+ *Cichorium intybus* L.	Chickory	12	SV
+ *Cirsium arvense* (L.) Scop.	Canada Thistle	2,3,4,10	SV
+ *Cirsium vulgare* (Savi) Tenore	Bull Thistle	5	SV
Conyza canadensis (L.) Cronq. (*Erigeron canadensis* L.)	Horse-weed	12	SV
Erigeron annuus (L.) Pers.	Fleabane	2,3,4,6	SV (TRT)
Erigeron philadelphicus L.	Philadelphia Fleabane	3,4	SV
Eupatorium maculatum L.	Spotted Joe-Pye Weed	2,3,4,5	SV
Eupatorium perfoliatum L.	Boneset	2	SV

ASTERACEAE (Cont'd) (COMPOSITAE)	ASTER FAMILY		
Eupatorium rugosum Houtt.	White Snakeroot	2,3,4,5,6,10	SV
Gnaphalium obtusifolium L.	Fragrant Cudweed	12	SV (TRT)
+ *Hieracium caespitosum* Dumort. (*H. pratense* Tausch)	Yellow Hawkweed	12	SV
Hieracium scabrum Michx.	Hawkweed	8	SV (TRT)
Lactuca biennis (Moench) Fern.	Tall Blue Lettuce	12	SV
Lactuca canadensis L.	Canada Lettuce	8	SV
Prenanthes alba L.	White Lettuce	8	SV
Prenanthes altissima L.		4,8,9	SV
Rudbeckia hirta L. (*R. serotina* Nutt.)	Black-eyed Susan	12	SV
Solidago altissima L.	Tall Goldenrod	5	SV
Solidago caesia L.	Blue-stem Goldenrod	6,8,10	SV
Solidago canadensis L.	Canada Goldenrod	2,7,8,12	SV
Solidago gigantea Ait.	Late Goldenrod	2,3,4,5,12	SV
Solidago graminifolia (L.) Salisb. (*Euthamia graminifolia* (L.) Nutt.)	Narrow-leaf Goldenrod	2,12	SV
Solidago hispida Muhl.	Hairy Goldenrod	8	SV
Solidago juncea Ait.	Early Goldenrod	12	SV
Solidago nemoralis Ait.	Gray Goldenrod	8,12	SV
Solidago rugosa Ait.	Rough Goldenrod	2,3,4,5,12	SV
Solidago uliginosa Nutt.	Bog Goldenrod	2,3,4	SV
+ *Tanacetum vulgare* L.	Tansy	12	SV
+ *Taraxacum officinale* Weber	Dandelion	6,7,8,9	SV
+ *Tragopogon dubius* Scop.	Goat's-beard	12	SV
+ *Tussilago farfara* L.	Sweet Coltsfoot	3,4	SV

SPECIES IN THE VICINITY OF THE ANSI (pers. comm. Dr. A.A. Reznicek)

North of the ANSI on south facing Lake Algonquin bluffs

Amelanchier sanguinea var. *grandiflora*	AAR (MICH)	*Desmodium paniculatum*	AAR (MICH)
		Elymus canadensis	AAR (MICH)
Andropogon gerardii	AAR (MICH)	*Festuca occidentalis*	AAR
Asclepias tuberosa	AAR	*Festuca saximontana*	AAR
Bromus kalmii	AAR (MICH)	*Goodyera oblongifolia*	AAR (MICH)
Carex aenea	AAR	*Helianthemum canadense*	AAR (MICH)
Carex cephalophora	AAR (MICH,TRT)	*Lechea intermedia*	AAR (MICH,TRT)
Carex richardsonii	AAR (MICH)	*Panicum virgatum*	AAR (MICH)
Ceanothus americanus	AAR (MICH)	*Platanthera hookeri*	AAR (MICH)
	RB (TRT)	*Polygala senega*	AAR (MICH)
Cyperus filiculmis	AAR (MICH)	*Sorghastrum nutans*	AAR (MICH)
Cyperus houghtonii	AAR (MICH)	*Taenidia integerrima*	RB (TRT)
Cypripedium arietinum	AAR (MICH)		

North of the ANSI in Innisfil Valley on seepage areas within 1 km of the ANSI

Betula pumila var. *glandulifera*	AAR (MICH)	*Malaxis monophylla*	JEH (MICH)
		Valeriana uliginosa	AAR (MICH)
Gentiana crinita	AAR (MICH)		

East of the ANSI

Aster pilosus var. *pilosus*	AAR (MICH)	*Helianthemum bicknellii*	AAR
Chenopodium foggii	AAR (MICH)	*Panicum oligosanthes*	AAR (MICH)
Cyperus filiculmis	AAR	*Panicum virgatum*	AAR

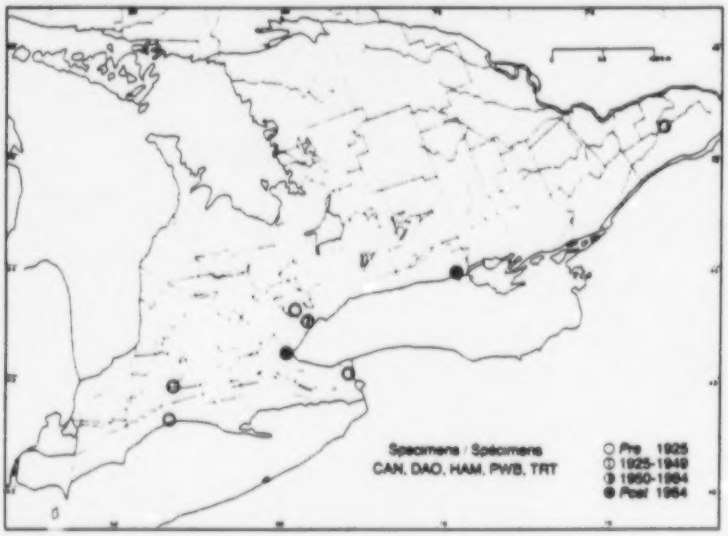
West of the ANSI, within 500 meters

Hieracium gronovii	RB (MICH)	*Malaxis unifolia*	RB (MICH)

APPENDIX B: DISTRIBUTION IN NORTH AMERICA AND ONTARIO FOR THREE PROVINCIALLY RARE PLANT SPECIES AT ALLANDALE LAKE ALGONQUIN BLUFFS ANSI: DROOPING SEDGE (*Carex prasina*), AMERICAN GINSENG (*Panax quinquefolium*) AND RUGULOSE GRAPEFERN (*Botrychium rugulosum*)

***Carex prasina* Wahlenb.**

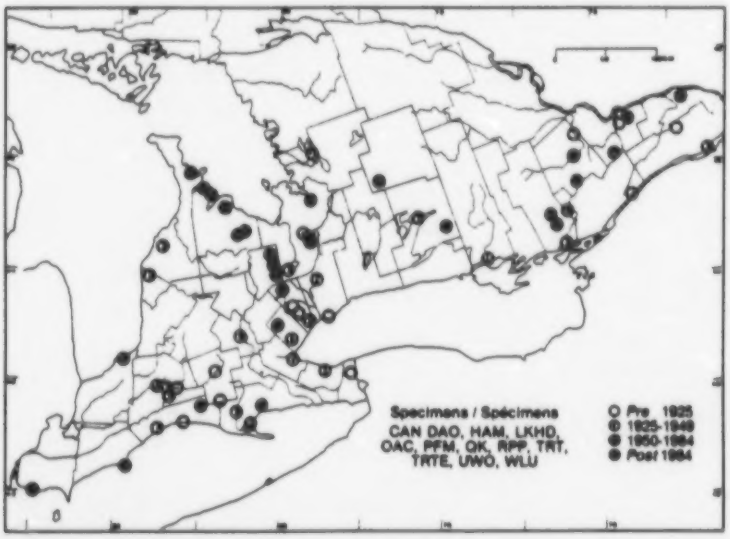
Drooping sedge
Carex



Ball & White, 1982

***Panax quinquefolium* L.**

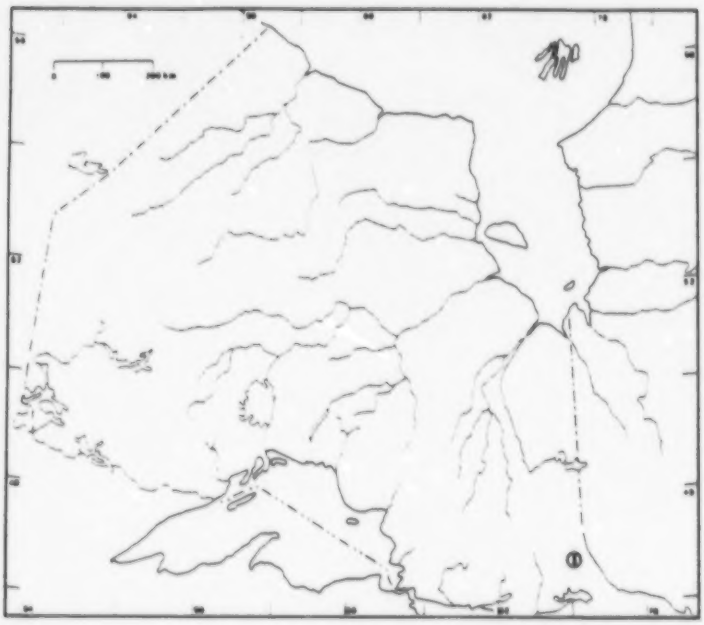
American ginseng
Ginseng

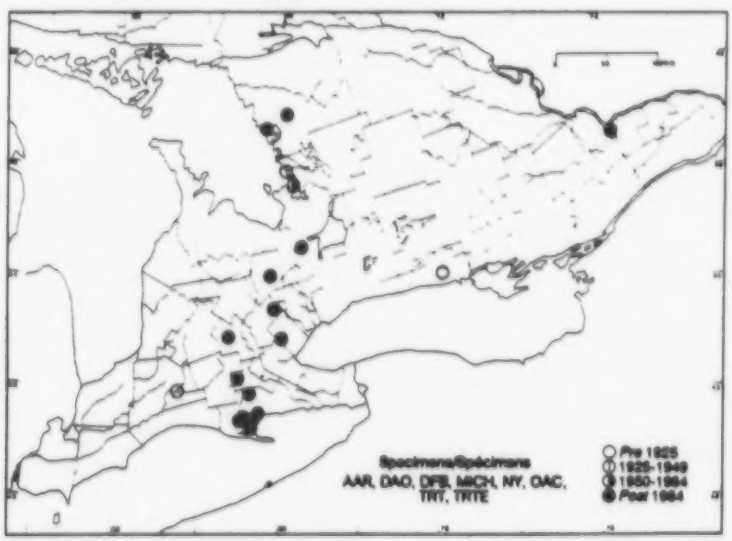


Argus & White, 1984

***Botrychium rugulosum* W.H. Wagner**
(*B. multifidum* (Gmel.) Rupr. f. *dentatum* R. Tryon,
B. ternatum auctt. non (Thunb.) Sw.)

Rugulose grapefern, ternate grapefern
Botryche rugueux





Pryer & Britton, 1987

APPENDIX C: BIRDS OF THE ALLANDALE LAKE ALGONQUIN BLUFFS AREA OF NATURAL AND SCIENTIFIC INTEREST

Fifteen species of breeding birds were observed in the study area on July 10, 1987. The breeding status follows that outlined for the Atlas of the Breeding Birds of Ontario (Cadman *et al.*, 1987). All observations are those of Joyce Gould and the author.

	Breeding Evidence		
Species	**Possible**	**Probable**	**Confirmed**
Mourning Dove	SM		
Black-billed Cuckoo	SM		
Hairy Woodpecker			FY
Northern Flicker	SM		
Eastern Wood-Pewee	SM		
Blue Jay	SM		
Black-capped Chickadee	SM		
White-breasted Nuthatch	SM		
House Wren	SM		
Wood Thrush	SM		
American Robin	SM		
Warbling Vireo	SM		
Ovenbird	SM		
Common Yellowthroat	SM		
Northern Oriole	SM		

Legend:

SM Singing male(s) present, or breeding calls heard, in suitable nesting habitat in breeding season.

FY Recently fledged young

APPENDIX D: MAMMALS AND AMPHIBIANS OF THE ALLANDALE LAKE ALGONQUIN BLUFFS AREA OF NATURAL AND SCIENTIFIC INTEREST

This list is a compilation of incidental observations of mammals and amphibians within the study area. It is based on observations made by Steve Varga (SV) and Peter M. Harvie (PH) during 1987.

Common Name	Species	Evidence	Source
MAMMALS			
Raccoon	*Procyon lotor*	Tracks	SV
Striped Skunk	*Mephitis mephitis*	Smelled	SV
Coyote	*Canis latrans*	Den and observed with young	PH
Red Fox	*Vulpes fulva*	Observed	SV
Woodchuck	*Marmota monax*	Observed	SV
Eastern Chipmunk	*Tamias striatus*	Observed	SV
Eastern Gray Squirrel	*Sciurus carolinesis*	Observed	SV
Red Squirrel	*Tamiasciurus hudsonicus*	Observed	SV
Beaver	*Castor canadensis*	Dams	SV
Porcupine	*Erethizon dorsatum*	Observed	SV
White-tailed Deer	*Odocoileus virginianus*	Observed	SV
AMPHIBIANS			
Spring Peeper	*Hyla crucifer*	Observed	SV
Northern Leopard Frog	*Rana pipiens*	Observed	SV

APPENDIX E: SLIDE DESCRIPTIONS

The following slides were taken on site by the author in 1987. All slides are on file with the Ontario Ministry of Natural Resources, Central Region, Parks and Recreational Areas Section, Richmond Hill.

1. Active gravel pit abutting the western end of the ANSI - Oct., 1987.

2. Stream through a mature mixed swamp (community type 4a) in the western portion of the ANSI - Oct., 1987.

3. On the edge of a streamside meadow marsh (community type 2) looking towards a mixed swamp (community type 4) in the western portion of the ANSI - Oct., 1987.

4. and
5. On Bracken Fern-grasslands looking towards a treeline demarcating the western edge of the ANSI - Oct., 1987.

6. and
7. On Road 31 looking northeast towards the Lake Algonquin bluffs, and off in the distance the southfacing bluffs which define the edge of a 3 km wide, transverse valley (the former bed of Lake Algonquin) - Oct., 1987.

APPENDIX F: GENERAL INFORMATION SHEET - ALLANDALE LAKE ALGONQUIN BLUFFS AREA OF NATURAL AND SCIENTIFIC INTEREST

Postglacial Bluffs

The prominent bluffs between Georgian Bay and Lake Simcoe were created about 12,000 years ago by postglacial Lake Algonquin (this large lake encompassed today's Lakes Michigan, Huron, Superior and Simcoe, and the surrounding lowlands). The rugged topography of these bluffs support large forested tracts and provides habitat for a number of significant plant and animal species. The bluffs are also important hydrologically as a headwater source for many of the streams in the Region. Moreover, the large size of the forested bluffs make them ideal areas for scientific research, nature education and interpretation. Some of the bluffs are being impacted by urbanization.

Inventory of Areas of Natural and Scientific Interest (ANSI)

The ANSI Program of the Ministry of Natural Resources has identified life science and earth science features and sites which best represent the vegetation and landforms of Ontario. Criteria such as representation, diversity, condition and special features are used to select Areas of Natural and Scientific Interest. Biological inventories of these areas have also been initiated to further identify their significance, and to re-evaluate the boundaries of these sites.

Significance of the Allandale Lake Algonquin Bluffs Area of Natural and Scientific Interest

Allandale Lake Algonquin Bluffs is a 539 ha bluff and wetland complex situated near the City of Barrie in Simcoe County. It is the least disturbed and most vegetatively diverse example of postglacial Lake Algonquin bluffs in the Region.

Two provincially/nationally rare plants, American Ginseng and Drooping Sedge, the provincially rare Rugulose Grapefern and eleven regionally rare plants, occur here. The fauna is representative of the area.

Additional information can be obtained from:

Regional Ecologist
Parks and Recreation Areas Section
Ministry of Natural Resources
10670 Yonge Street
Richmond Hill, Ontario
L4C 3C9
(416) 883-3247

APPENDIX G:

AREA OF NATURAL AND SCIENTIFIC INTEREST – LIFE SCIENCE INVENTORY CHECK-SHEET

NAME	MAP NAME	MAP NUMBER	UTM REF.
Allandale Lake Algonquin Bluffs	Barrie	31D/5	010100

COUNTY, DISTRICT or REGIONAL MUNICIPALITY: Simcoe County

LAT. 44° 20'N | LONG. 79° 44'W | ALT. MIN. - MAX. 220 m - 318 m

LOCALITY: 2 km southwest of Allandale

TOWNSHIP	LOTS	CONCESSIONS
Essa	26-28	IX
	27,28	X
	27,28	XI
Innisfil	1-4	XII
	1-5	XIII

AREA: 1333 acres 539 ha

OWNERSHIP: private

ADMINISTRATION:

FOREST REGION AND DISTRICT: L-1

SITE REGION AND DISTRICT: 6-8

MNR REGION AND DISTRICT: Central-Huronia

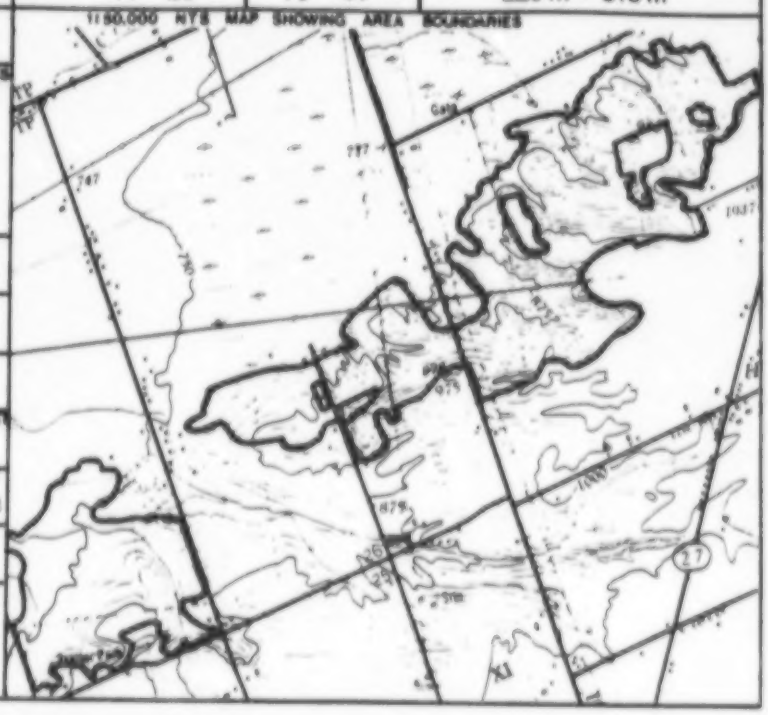
CONSERVATION AUTHORITY: Nottawasaga

AERIAL PHOTOGRAPHS

BASE MAP:

YEAR	ROLL	FLIGHT LINE	NUMBERS
1978	10	4422	107-109
	10	4423	21-28
	52	4424	322-328
	10	4425	66-70

1:50,000 NTS MAP SHOWING AREA BOUNDARIES



PHYSICAL AND BIOLOGICAL FEATURES

The Allandale Lake Algonquin Bluffs contain two distinct landforms: a 7 km long, 50 to 70 m high erosional bluff (the shoreline of post-glacial, Lake Algonquin), and the former lake bed.

The bluffs are characterized by a prominent mid-slope terrace, and are highly dissected by 7 valley systems, greatly adding to the diversity of slope aspects. They support extensive deciduous forests of Red Oak on dry sites, Sugar Maple on mesic sites, and Large-toothed Aspen, in combination with the first two species, on successional, post-logged sites. Other deciduous trees, such as Beech, Red Maple and Trembling Aspen dominate smaller areas. Mixed forests of Hemlock, White Cedar, or White Pine are infrequent. These forest communities are significant, because they represent the largest and most vegetatively diverse example of Lake Algonquin erosional bluffs in the Simcoe Uplands/Lowlands, the oak forests are unique in the Region, being the only sizeable example on Algonquin bluffs in the ANSI system.

Large seepage areas on the valley bottomlands, the lowlands below the bluffs and some of the mid-slope terraces, sustain conifer, mixed and deciduous swamps. Emergent marsh, meadow marsh and beaver ponds occur as minor non-forested communities within these swamps.

Anthropogenic communities occupy less than 10% of the ANSI. They include: scattered upland fields (supports 3 regionally rare plants with prairie affinities), an abandoned borrow pit, a man-made pond, and five small conifer plantations. Larger anthropogenic communities have been excluded from the ANSI (e.g. the large abandoned quarry in the central portion, and two areas of cultivated field and conifer plantations in the eastern portion).

DATA SHEETS ATTACHED

PHYSICAL DESCRIPTION	0	SUMMARY SPECIES LISTS	0
VEGETATION SUMMARY	0	PHYSICAL FEATURES MAP	
EVALUATION SHEET	0	VEGETATION MAP	0
COMMUNITY DESCRS.	0	BIBLIOGRAPHY	0
COMMUNITY COMP. LISTS	0	PHOTOGRAPHS	0

MAJOR INFORMATION SOURCES

Hanna, 1980, Airphoto interpretation, 1984a; Varga, 1987-88, field visits

EVALUATION AND PRIORITIES

The least disturbed and most vegetatively diverse bluff complex in the Simcoe Uplands/Lowlands Physiographic Regions with habitat for 2 nationally rare, 1 provincially rare and 11 regionally rare plant species.

DATE COMPILED

COMPILER

AREA OF NATURAL AND SCIENTIFIC INTEREST – LIFE SCIENCE INVENTORY CHECK-SHEET

NAME	MAP NAME	MAP NUMBER	UTM REF.
Allandale Lake Algonquin Bluffs	Barrie	31D/5	010100

COUNTY, DISTRICT or REGIONAL MUNICIPALITY: Simcoe County

LAT. 44° 20'N | LONG. 79° 44'W | ALT. MIN. – MAX. 220 m - 318 m

LOCALITY: 2 km southwest of Allandale

TOWNSHIP	LOTS	CONCESSIONS
Essa	26-28	IX
	27,28	X
	27,28	XI
Innisfil	1-4	XII
	1-5	XIII

AREA: 1333 acres 539 ha

OWNERSHIP: private

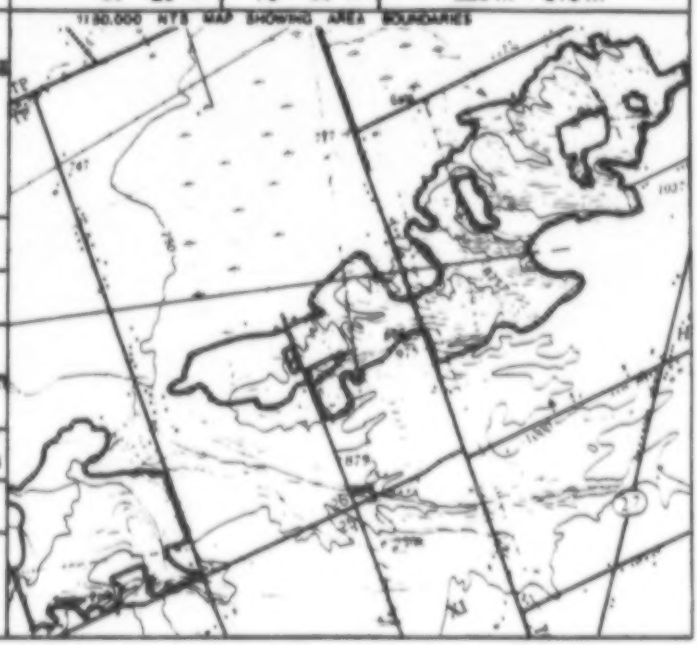
ADMINISTRATION:

FOREST REGION AND DISTRICT	SITE REGION AND DISTRICT
L-1	6-8
MNR REGION AND DISTRICT	CONSERVATION AUTHORITY
Central-Huronia	Nottawasaga

AERIAL PHOTOGRAPHS (BASE MAP)

YEAR	ROLL	FLIGHT LINE	NUMBERS
1978	10	4422	107-109
	10	4423	21-28
	52	4424	322-328
	10	4425	66-70

1:50,000 NTS MAP SHOWING AREA BOUNDARIES



PHYSICAL AND BIOLOGICAL FEATURES

The Allandale Lake Algonquin Bluffs contain two distinct landforms: a 7 km long, 50 to 70 m high erosional bluff (the shoreline of post-glacial, Lake Algonquin), and the former lake bed.

The bluffs are characterized by a prominent mid-slope terrace, and are highly dissected by 7 valley systems, greatly adding to the diversity of slope aspects. They support extensive deciduous forests of Red Oak on dry sites, Sugar Maple on mesic sites, and Large-toothed Aspen, in combination with the first two species, on successional, post-logged sites. Other deciduous trees, such as Beech, Red Maple and Trembling Aspen dominate smaller areas. Mixed forests of Hemlock, White Cedar, or White Pine are infrequent. These forest communities are significant, because they represent the largest and most vegetatively diverse example of Lake Algonquin erosional bluffs in the Simcoe Uplands/Lowlands, the oak forests are unique in the Region, being the only sizeable example on Algonquin bluffs in the ANSI system.

Large seepage areas on the valley bottomlands, the lowlands below the bluffs and some of the mid-slope terraces, sustain conifer, mixed and deciduous swamps. Emergent marsh, meadow marsh and beaver ponds occur as minor non-forested communities within these swamps.

Anthropogenic communities occupy less than 10% of the ANSI. They include: scattered upland fields (supports 3 regionally rare plants with prairie affinities), an abandoned borrow pit, a man-made pond, and five small conifer plantations. Larger anthropogenic communities have been excluded from the ANSI (e.g. the large abandoned quarry in the central portion, and two areas of cultivated field and conifer plantations in the eastern portion).

DATA SHEETS ATTACHED

PHYSICAL DESCRIPTION	0	SUMMARY SPECIES LISTS	0
VEGETATION SUMMARY	0	PHYSICAL FEATURES MAP	
EVALUATION SHEET	0	VEGETATION MAP	0
COMMUNITY DESCRS.	0	BIBLIOGRAPHY	0
COMMUNITY COMP. LISTS	0	PHOTOGRAPHS	0

MAJOR INFORMATION SOURCES

Hanna, 1980, Airphoto interpretation, 1984a; Varga, 1987-88, field visits

EVALUATION AND PRIORITIES

The least disturbed and most vegetatively diverse bluff complex in the Simcoe Uplands/Lowlands Physiographic Regions with habitat for 2 nationally rare, 1 provincially rare and 11 regionally rare plant species.

DATE COMPILED	COMPILER
April 1988	S. Varga (revised from Hanna, 1984a)

Ontario Ministry of Natural Resources, Parks and Recreational Areas Programme, Queen's Park, Toronto, Ontario M7A 1W3

MAPS
NOT
FILMED

CARTES
OMISES